Croplife

A BUSINESSPAPER FOR THE FARM CHEMICAL INDUSTRY

MEMBER, BUSINESS PUBLICATIONS AUDIT

BPA

PRODUCTION EDITION

A Miller Publication
Business Journalists Since 1873

Vol. 7 | JULY 4, 1960 | No. 24

News Briefs . . .

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GRANULAR PLANT to be constructed in Alabama by Cotton Producers Assn. Completion set for Dec. 1. **Story page 2.**

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KHAPRA BEETLE infestations found on 27 ships entering U.S. harbors since May 1, 1960, USDA reports. Numbers on the increase. **Story page 2.**

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SULFUR PRODUCTION begins at Freeport's offshore mine in Gulf of Mexico off Louisiana coast. **Picture and story page 2.**

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CORPORATE NAME CHANGE has been registered by Agriform of Northern California. **Story page 20.**

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TRIPLE DAMAGES will be assessed by State of New Hampshire against manufacturers whose plant food products are lower than guarantees. **Story page 17.**

●

NPFI OFFICERS named at recent convention. Picture of key leaders of National Plant Food Institute for 1960-61, seen on **page 5.**

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WORKERS at International Minerals & Chemical Corp. Niagara Falls plant vote to remain with AFL-CIO in recent election. **Story on page 27.**

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Accepted as Controlled Circulation
Published Bi-Weekly by The Miller Publishing Co.
Minneapolis, Minn.

Subscription Rates:
$5 for 1 year; $9 for 2 years

Lack of Controls Costs Fertilizer Trade $8 Million

Panel at NPFI Convention Tells How Losses in Fertilizer Plants Can Be Reduced Through Adequate Chemical Controls Over Product; Manufacturing No Longer an Art in Complex Chemical Processing

CHEMICAL CONTROL PANEL—Led by Dr. Vincent Sauchelli, National Plant Food Institute Chemical Technologist, right, the panel on chemical controls in fertilizer manufacturing plants discussed many aspects of the problem during the recent NPFI convention at White Sulphur Springs, W. Va. Panel members, in addition to Dr. Sauchelli, left to right, are: Dr. Stacy Randle, J. R. Archer, Edwin M. Glocker, Dale C. Kieffer, C. H. Russell, and Al Spillman.

NPFI Panel Calls Shrinkages Too Costly

THAT LOSSES in fertilizer manufacturing through lack of adequate controls are costing the industry an estimated $6 to $8 million a year was pointed out in a panel discussion by experts at the recent Greenbrier meeting of the National Plant Food Institute. The group, led by Dr. Vincent Sauchelli, chemical technologist of the Institute, pointed out the importance of standardization of sampling and the Magruder system of checking analyses; the problem of shrinkage in plants and what to do about it.

Dr. Sauchelli, in his introduction to the subject, said that the fertilizer industry's loss through overruns in nitrogen, phosphate, and potash amounts to many millions each year . . . a shrinkage that the trade can ill-afford. One company, he reported, measured its losses through overruns and was amazed to find they totaled $38,000 for one year. Such a disclosure prompted this manufacturer to do something about his losses from this source, but the industry as a whole continues to suffer from this malady, he said.

Much can be done to prevent such losses, Dr. Sauchelli said. As an initial move in this direction, he said, the National Plant Food Institute launched a collaborative study in which were included the Association of Official Agricultural Chemists and the Association of American Fertilizer Control Officials. The project received the benefit of voluntary aid from three state chemical control laboratories and the U.S. Department of Agriculture, Dr. Sauchelli stated. He termed it as "one of the most comprehensive studies made in our industry to improve sampling and chemical analytical procedures as one means of reducing

(Report Continued on page 5)

Phosphate Production on the Increase During Past 10-Month Period

WASHINGTON — Production of superphosphate and other phosphate fertilizers was up in July, 1959-April, 1960, as compared to the same months of the previous season. Shipments of these materials were also on the increase, except for normal and enriched, which decreased 6%. The following figures were recently released by the U.S. Department of Commerce "Current Industrial Reports" prepared by the Bureau of the Census.

In July, 1959, through April, 1960, preliminary totals show that production of the various grades of superphosphate and other phosphate fertilizers totalled 2,206,373 tons as compared to 2,099,144 tons during the same period a year earlier. Shipments were 1,632,359 tons and 1,622,670 tons, respectively.

Normal and enriched production during the latest period was 1,145,978 tons as compared to 1,141,911 tons the previous period. Shipments were less for the 1960 period, however, being 587,661 tons as compared to 626,231 tons. Concentrated superphos-

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Table 1.—SUPERPHOSPHATE AND OTHER PHOSPHATIC FERTILIZERS: PRODUCTION, SHIPMENTS, CONSUMPTION, AND STOCKS, CLASSIFIED BY TYPE, IN THE UNITED STATES, 1959

(In short tons of 100% P_2O_5)

Product and item	Total	January	February	March	April	May	June	July	August	September	October	November	December
TOTAL													
Stocks on hand, beginning of month	...	[1]361,750	370,194	368,156	287,141	171,406	150,595	229,917	276,912	286,695	275,685	286,148	324,680
Production	2,609,592	225,350	251,724	256,612	249,462	257,006	187,649	170,876	180,126	196,551	218,808	221,540	256,088
Receipts at plants	16,086	276	659	1,922	3,026	1,790	262	169	895	1,985	3,401	1,143	618
Book adjustments (account of inventory)	+5,717	+157	+102	+1,000	+1,684	+1,760	+1,212	+961	-467	+542	-474	-585	-177
Shipments	1,885,001	149,402	169,666	250,492	255,551	179,481	80,821	98,682	127,056	154,164	146,907	129,171	143,608
Used in reporting plants	751,308	65,937	64,857	90,057	114,556	81,886	28,980	26,329	43,715	55,464	64,365	54,597	60,765
Stocks on hand, end of month	...	370,194	368,156	287,141	171,406	150,595	229,917	276,912	286,695	275,685	286,148	324,680	356,856
NORMAL AND ENRICHED SUPERPHOSPHATE													
Stocks on hand, beginning of month	...	[1]178,014	180,235	189,130	167,004	105,967	96,255	141,547	164,098	175,602	182,294	182,827	195,307
Production	1,393,504	124,850	128,387	139,689	149,195	135,373	96,149	77,449	87,440	101,787	115,572	116,714	122,959
Receipts at plants	8,669	805	478	1,455	2,104	1,095	180	169	581	876	798	747	889
Book adjustments (account of inventory)	+2,540	+879	+867	-485	+488	+1,798	+1,047	+131	-287	+887	-572	-240	+189
Shipments	682,802	60,597	59,261	78,006	105,061	72,664	23,580	31,043	38,096	44,745	56,550	55,853	37,686
Used in reporting plants	697,486	62,476	60,976	84,569	107,795	73,844	26,644	24,161	40,148	49,255	59,589	50,808	56,373
Stocks on hand, end of month	...	180,235	189,130	167,004	105,967	96,255	141,547	164,098	175,602	182,294	182,827	195,307	204,459
CONCENTRATED SUPERPHOSPHATE													
Stocks on hand, beginning of month	...	[1]152,610	157,360	148,812	101,881	51,964	41,865	68,685	84,274	86,268	75,869	79,380	99,849
Production	895,202	74,902	76,775	89,740	71,413	74,946	65,562	68,909	69,591	67,911	78,685	76,805	86,665
Receipts at plants	7,417	71	181	469	982	695	142	...	334	1,249	2,609	396	349
Book adjustments (account of inventory)	+2,995	-105	-188	+1,755	+1,289	-285	-60	+840	-158	+60	-94	+11	-98
Shipments	880,007	67,271	84,274	134,916	117,986	79,309	37,082	52,667	64,806	76,526	68,885	54,885	55,182
Used in reporting plants	42,195	2,847	3,082	3,979	3,555	3,466	1,802	1,513	2,987	3,099	3,796	3,180	3,089
Stocks on hand, end of month	...	157,360	148,812	101,881	51,964	41,865	68,685	84,274	86,268	75,869	79,380	99,849	124,080
AMMONIUM PHOSPHATE[2]													
Stocks on hand, beginning of month	...	20,265	19,258	18,010	11,957	8,758	9,580	15,782	22,059	23,147	16,595	21,105	24,604
Production	200,897	12,283	13,312	15,689	16,170	17,604	19,178	16,055	15,984	17,219	20,157	17,647	19,031
Receipts at plants	...	...	...	...	...	...	...	...	...	...	...	...	...
Book adjustments (account of inventory)	+155	+2	+85	...	-5	+1	-10	-10	...	+75	-1	-15	+95
Shipments	195,511	13,046	14,265	21,271	18,960	16,316	12,729	8,565	13,555	23,044	15,258	13,730	21,034
Used in reporting plants	4,991	866	298	451	464	467	258	408	505	804	366	408	491
Stocks on hand, end of month	...	19,258	18,010	11,957	8,758	9,580	15,782	22,059	23,147	16,595	21,105	24,604	22,085
OTHER PHOSPHATIC FERTILIZERS (INCLUDING WET-BASE GOODS)													
Stocks on hand, beginning of month	...	10,861	13,361	12,204	6,319	4,737	2,895	3,904	5,687	3,658	2,955	3,436	5,280
Production	120,599	11,355	11,270	11,494	12,684	9,785	6,760	8,445	7,171	9,454	10,396	10,574	11,453
Receipts at plants	...	...	...	...	...	...	...	...	...	...	...	...	...
Book adjustments (account of inventory)	+31	+1	...	-62	-28	+296	+255	...	-42	-20	-7	-39	-305
Shipments	118,682	8,488	11,866	16,299	13,564	11,198	5,690	6,409	8,861	9,851	9,854	7,385	9,884
Used in reporting plants	6,656	348	561	1,018	674	789	296	253	297	306	654	868	678
Stocks on hand, end of month	...	13,361	12,204	6,319	4,737	2,895	3,904	5,687	3,658	2,955	3,436	5,280	6,174

[1]Stocks at the beginning of the year differ from the quantities held at the end of the preceding year because of revisions not carried to previous year.
[2]Collected in cooperation with the Bureau of Mines.

Anhydrous Output Up in April, Dept. Of Commerce Says

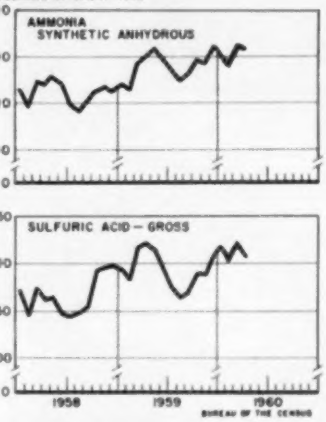
But Some Other Chemical Products Fall Behind as Compared to 1959 Output

WASHINGTON — Production of some fertilizer items in April, 1960, was greater than that of the same month in 1959, but other products were made in lesser quantities, according to a report on inorganic chemicals just issued by the U.S. Department of Commerce.

Anhydrous ammonia was among the products gaining in tonnage in April, 1960. Output for the later period was 416,220 tons, whereas in April, 1959, it was 400,156. In addition, stocks at producing plants were also lower in April, 1960, as compared to the month of March, 1960. Respective figures were 143,635 tons and 246,038 tons.

PRODUCTION OF INORGANIC CHEMICALS

THOUSANDS OF SHORT TONS



Nitric acid production was also up, registering 275,457 tons in April, 1960, and 268,141 tons in the same month of last year. Stocks at producing plants were also slightly lower in April of this year.

Total production of phosphoric acid in April this year also showed an increase to 181,541 tons from 168,177 tons. In addition to these favorable figures, stocks at producing plants were also lower by nearly

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New Insecticide Plant Planned for Erection On California Site

HANFORD, CAL. — A farmer-owned and controlled insecticide plant will be built here soon, according to Louis A. Rozzoni, president of the California Farm Bureau Federation.

A plant manager with many years of experience with large national chemical companies in the making of these products has been hired, Mr. Rozzoni announced.

Over half of the needed money for the plant has already been raised. Additional funds are being raised by local farm supply companies and the California Farm Supply Co., which will operate the plant.

The new plant will produce various spray materials and all types of dusts.

FILM WINS AWARD

WASHINGTON — One of the National Plant Food Institute's educational movies, "Cash in on Grass," captured a blue ribbon award in the American Society of Agricultural Engineers film competition recently.

In notifying NPFI, W. L. Maxwell, chairman of the 1960 sub-committee on movies, said ". . . We feel that 'Cash in on Grass' is superior and the scoring of the judges entitles the film to a blue ribbon which it justly deserves."

The award was made by the ASAE Committee on Extension at its 53rd annual meeting at Ohio State University.

Khapra Beetle Threat Seen With Increased Numbers of Arrivals on Ships Since May 1

WASHINGTON — Infestations of the khapra beetle have been found on 27 ships entering U.S. ports since May 1, the U.S. Department of Agriculture reports.

Locations at which the beetles were found include the St. Lawrence Seaway ports of Duluth, Ashtabula, Ohio, and Buffalo, and the seaports of San Francisco and San Pedro, Cal., New York, Philadelphia, Baltimore, Houston, Wilmington, N.C., and Charleston, S.C.

The 27 finds by plant quarantine workers of USDA's Agricultural Research Service are indicative of the recent increase in interceptions of this pest. Infestations have been discovered 113 times since July 1, 1959, compared with 44 interceptions recorded at ports of entry during the 12 months starting July 1, 1958.

Quarantine inspection along the Great Lakes was increased as soon as the St. Lawrence Seaway opened the Grain Belt states to the threat of invasion by khapra beetles.

Efforts Intensified

Efforts to prevent the further entry of this pest into the U.S. are being intensified. Quarantine service has been established at all seaway ports receiving foreign shipping to assure greater protection against the introduction of the beetle and other plant and animal pests and diseases. Staffs at Chicago, Cleveland and Detroit will be further increased as soon as conditions permit.

U.S. Customs officers and representatives of other federal and state agencies are cooperating in the effort to prevent the entry of agricultural pests and diseases. In the Great

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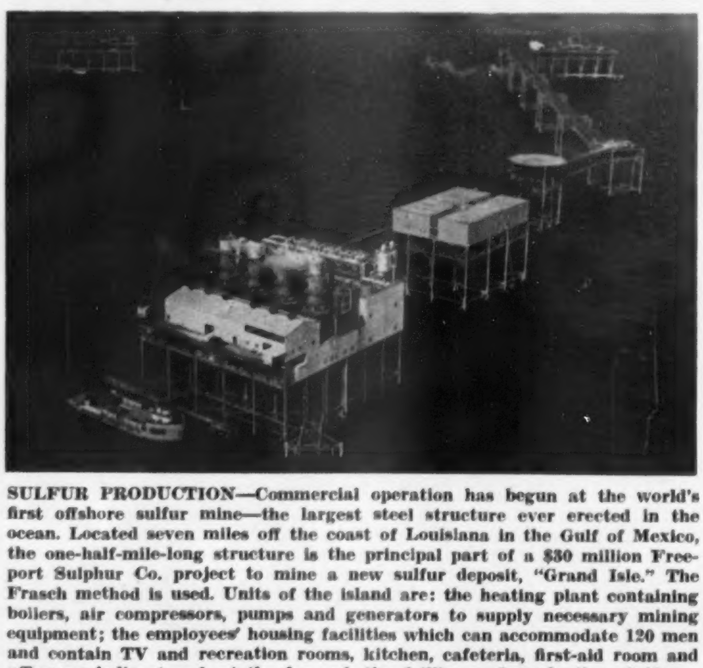


SULFUR PRODUCTION—Commercial operation has begun at the world's first offshore sulfur mine—the largest steel structure ever erected in the ocean. Located seven miles off the coast of Louisiana in the Gulf of Mexico, the one-half-mile-long structure is the principal part of a $30 million Freeport Sulphur Co. project to mine a new sulfur deposit, "Grand Isle." The Frasch method is used. Units of the island are: the heating plant containing boilers, air compressors, pumps and generators to supply necessary mining equipment; the employees' housing facilities which can accommodate 120 men and contain TV and recreation rooms, kitchen, cafeteria, first-aid room and offices; a heliport and, at the far end, the drilling and production platform.

'A Growing Concern' . . .

Efficient Equipment Aids Production at Ohio Fertilizer Unit

THE SLOGAN used by Knox Chemical Co., Mt. Vernon, Ohio, is "A Growing Concern." It is a meaningful phrase to the farmer who sees it in print, and it is also meaningful to M. C. Hoover and John Harsany, owners, for their business is growing.

Organized only a little over a year ago, Knox Chemical Co. produces liquid fertilizers of different analyses in accordance with customers' demand. The company is set up to give quick service to farmers in the area. Liquid fertilizers in this region, Mr. Harsany advises, are used mainly for straight fall plowdown, for corn, potatoes and hay meadow.

The firm does 75% of its business in the spring and about 25% in the fall. The soils of the trade area are composed of heavy clay in some sections and are light and sandy in others. This makes for a wide difference in fertilizer recommendations and in crop yields.

Mr. Harsany says that corn in the area usually calls for 6-18-S, hay meadow for 5-10-10 and potatoes for 8-16-16. Farmers who use heavy applications get as high as 600 bu. an acre, Mr. Harsany reports.

The firm tests soil free of charge for customers, and this service is very popular. Knox Chemical issues a little mailing piece, printed on both sides, with one side devoted largely to the soil test service. Farmers are encouraged to gather their own soil samples and bring them to the Knox office for analysis.

"We find that many farmers in this area believe in soil testing," states Mr. Harsany, "and they will consider the fertilization recommendations very carefully. Some will fertilize up to recommendations, others will not. Those farmers who get fertilizer loans are inclined to fertilize heavier, it seems, for then the financial burden can be spread over a longer period."

The Knox plant has a storage capacity of 60,000 gal. The plant uses the batch system, with potash being the only dry material used. The potash comes in by railroad car, and can be unloaded into a storage bin with a front end shovel. This storage bin is five feet higher than the first floor of the plant.

Thus when it comes time for the machine to dump potash into the 5-ton batch mixer, the elevation is just about right for easy material handling. The mixer extends eight feet into a basement.

The plant has a Bell & Gossett pump, with a capacity of 400 gal. a minute. Liquid can be pumped from the mixer into storage or brought back into the plant from storage. The entire plant was designed and installed by Mid States Machinery Co., Decatur, Ill.

Knox Chemical Co. has three application outfits for spraying fertilizer on fields. A truck boom, with a power takeoff pump and jet nozzle, can spray 42 to 72 ft. in width in one swath. An acre can be sprayed with this outfit in about one minute, which assures speedy application once the truck gets on the premises. Application charges are $1 per acre.

The firm has an 85-acre demonstration farm and this year tried a number of interesting experiments. For example, in an effort to produce 200 bu. an acre corn, Mr. Harsany plowed down 300 lb. nitrogen and also added 100 lb. potash and 100 lb. phosphate.

In another experiment he divided a piece of land into 40 row plots. Each plot was soil tested. Corn was planted in each eight rows and fertilized. The season was extremely dry, but results were good:

Per acre rate		Yield bu.
First 8 rows—No fertilizer applied	.....	40.8
Next 8 rows— 500 lb.	14-7-7	69.6
Next 8 rows—1,000 lb.	14-7-7	74.5
Next 8 rows—1,500 lb.	14-7-7	89.4
Next 8 rows—1 ton per acre rate.....		96.8

"It pays to experiment with these various applications," states Mr. Harsany, "because it shows us what can be done. Farmers also know the various rates of application for our plots and become interested, and inspect the plots very frequently. We plan to do more of this type of demonstration work in 1960."

This new firm has a list of all farmers who have 100 acres or more, to whom are mailed literature. Much of this mail stresses the advantages of using liquids.

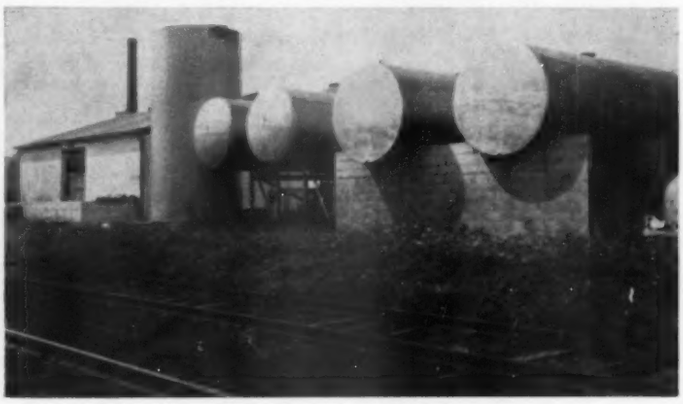
One mailing piece advises farmers that spreading charges are $1 per acre—over 400 lb. per acre $3 per ton. Freight charges per ton are also listed for 20 miles from the plant up to 50 miles.

The educational program of the Knox Chemical in addition to newspaper and mail advertising consists of talks to local agricultural classes at adult schools, upon invitation. At such classes Mr. Harsany talks about fertilizers, their nutrients, their application and crop yields. Mr. Harsany says that the Knox firm will also hold plant meetings for customers and prospects in 1960.

"We did very well in our first year in business," he states, "and we expect to more than double our volume in 1960."

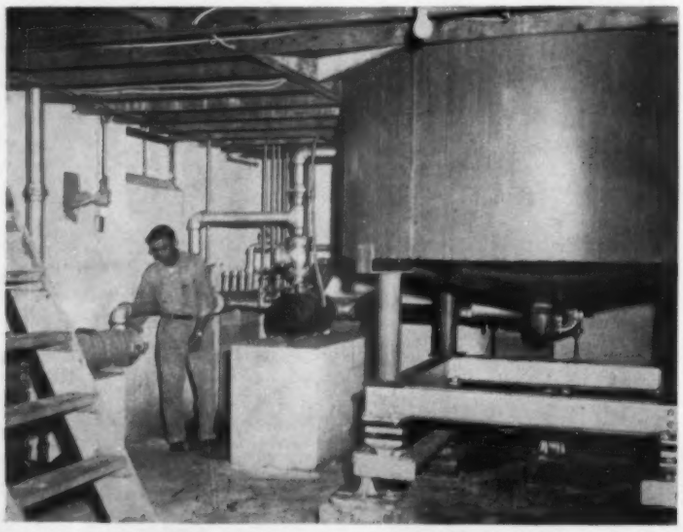
UNLOADING POTASH—Mechanized shovel takes potash from railroad car to bin. Floors of car and of bin are on the same level, simplifying the movement of materials. Mixer is at lower level, making easy unloading from storage area to mixer. Plant is designed for easy and economical operation.

LIQUID STORAGE—Below is photo of track area storage for 60,000 gallons liqu'd fertilizers at Knox plant, Mt. Vernon, Ohio.



PLANT OPERATORS—John Harsany, left, and his partner, M. C. Hoover, right, check over a new direct mailing piece with the firm's office manager. Much of the company's advertising is used to acquaint farmers in the area with Knox's soil test service. Growers are encouraged to gather their own soil samples and to bring them in for analysis. Soil tests are made free of charge to customers, and have proved to be a popular service.

Photo below shows Mr. Hoover in lower level of plant at valves operating plant. Note that the mixer on the floor above is submerged into basement to depth of eight feet.



Panel Declares More Controls Necessary in Plants

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the annual losses represented by overruns."

Panel members included Edwin M. Glocker, W. R. Grace & Co., Baltimore; Dr. Stacy Randle, New Jersey State Chemist and president, Association of American Fertilizer Control Officials, New Brunswick, N.J.; C. H. Russell, Monsanto Chemical Co., St. Louis, Mo.; J. R. Archer, International Minerals & Chemical Corp., Chicago; Dale C. Kieffer, Smith-Douglass Co., Inc., Norfolk, Va., and Albert Spillman, Fertilizer Manufacturing Cooperative, Baltimore, Md.

Mr. Glocker described the workings of the Magruder system of checking on analyses of fertilizers, showing on a chart the pattern of those mixtures over the line and those under. He said that a 10-10-10 product, for example, has many variables in raw materials, methods of sampling and procedures of testing. Consequently, it is necessary to keep a constant check on products so all customers may have full measure and the overages still not be excessive.

Dr. Randle, speaking from the viewpoint of a state control official whose responsibility it is to make sure that all fertilizer products are up to label specifications, said that improvements may be made in both manufacturing procedures and sampling techniques. He declared that continual study needs to be made on the variables in raw materials, errors in weighing and mixing, and other complexities arising from manufacturing methods.

The industry, he observed, can save itself thousands of dollars in closer attention to chemical controls, and following the system of analysis which gives the most consistent results.

The fertilizer trade should emphasize the value of its products in terms of yield and profit returns to the farmer, Dr. Randle said, rather than "to see how cheap the product can be sold."

"The entire industry has a stake in improvement of its products and in their uniformity," the New Jersey official said. "It must work toward minimizing variations in product through the use of first class materials and good technology in manufacturing."

Mr. Russell told the convention that a great need exists for detailed, standardized methods for sampling and assaying nitrogen fertilizer solutions. This is particularly true, he said, in view of the prospect for tremendous expansion of nitrogen solutions. In the period of 1955 to 1964, consumption of these solutions is expected to increase six times. In the form of direct application materials, it will increase 3.5 times and will double in the case of mixed solutions. The speaker presented a chart showing the projected figures of U.S. nitrogen consumption for 1955 and for 1964. (Table 1.)

Mr. Russell commented on the importance of uniformity in analytical methods, stating that even slight variations in such methods can result in failure of two or more laboratories to obtain concordant results on the same sample. It was to correct this situation, he said, that the NPFI called together industry chemists for preparation of the NPFI manual of detailed, standardized methods for sampling and analyzing nitrogen solutions and solid fertilizers. He then described sampling methods recommended in the manual.

"We are presently carrying out experiments designed to tell the optimum test conditions for determining ammonia, ammonium nitrate and urea in the mixed nitrogen solutions," he said. The next job is to determine the most practical method for industrial technicians to use when finding total nitrogen in solutions. Later, the subcommittee will determine the sensitivity and statistical precision, reproducibility and repeatability of the various methods published in the NPFI manual. The editorial committee plans to bring the manual up to date at one or two year intervals, Mr. Russell told the group.

Mr. Archer's approach to the problem was concerned with standardized methods of sampling and analysis. "The industry is conscious of the importance of shipping quality fertilizers which will meet analysis guarantees, satisfy customers, and at the same time comply with state control laws," he said in introduction. However, he added, meeting all of these requirements may not be a simple task since it involves both sampling and chemical analyses, and both procedures contain many variables. Mr. Archer then showed on the screen a series of photographs and charts showing actual sampling procedures with different types of instruments, and factors involved in the choice of which instrument to use.

The differences in results from use of different sampling tubes were shown graphically, using an 0-20-20 grade as an example. In two duplicate samples taken with the single tube sampler, he said, the phosphate content showed a difference of 2 units and the second sample of potash also showed a significant variation.

In a 20-0-20 granular fertilizer, samples taken with a single tube showed the nitrogen content to be only 16.53 and the potash to be 23.56; whereas the same sample taken with a double tube showed, respectively, 20.00 and 20.75. The differences, he said, were due to the types of instrument used in taking the samples.

Mr. Archer made a plea for more detailed sampling instructions, saying that presently-available AOAC abbreviated instructions are not adequate to cover the wide variety of fertilizer distributed. He added that this is particularly true because many sample men lack a technical background.

"A company's most precious asset is its reputation and ability to distribute quality products. When a laboratory fails to use sound sampling and laboratory techniques, reputations are at stake," he concluded.

The subject of in-plant shrinkage was tackled by the final two speakers on the panel. Dale C. Kieffer discussed the matter of finding spots where losses are occurring, and Albert Spillman gave the group some pointers on what to do about such losses when they are found.

Mr. Kieffer said that there are some losses where the source is easy to locate, but others where shrinkage remains a mystery. He said that in the old days of non-granular manufacturing of relatively low-analysis goods, no one worried much about losses. Allowances of about 2% were made across the board, and most manufacturers regarded such losses as either inevitable or too costly to correct.

With the advent of high-analysis granular mixes and liquids, however, the spectre of loss became more acute and today any shrinkage beyond the barest minimum is completely uneconomical. Even little losses can add up to prohibitive costs in the course of a year, the speaker said.

Among the plant areas where losses are most likely to occur, Mr. Kieffer said, are in the drier where overheating can cause losses, and from which escaping dust can amount to significant amounts; and in coolers where dust is the main culprit. Steam and gases take their toll also, he said.

In liquids and anhydrous ammonia, losses are often severe in handling and in spillage. One can figure the extent of losses fairly accurately, he said, by calculating the difference between the quantity of raw materials bought and the weight of finished goods sold to the customer.

Following Mr. Kieffer's talk on finding sources of loss within the plant, Mr. Spillman urged his fertilizer manufacturing audience to keep accurate records of everything involved in production operations. "Shrinkage," he said, "is not new. It now amounts to about 1½ to 2%, which is about like it has been for years. However, such shrinkage takes on more importance under present-day conditions," he added.

Two kinds of shrinkage face the operator. One is the obvious, which he called "tangible," and the other, which requires some investigation to find, "intangible." A good plant operator can usually find some way to fix the former, but stopping the latter involves a basic change from regarding production as an art, to realizing it is a science.

Mr. Spillman recommended a step-by-step appraisal of each phase of every operation in the plant. The contents of raw materials should be inspected, and the plant's weighing equipment must be under constant scrutiny. The latter is a key point in cutting down losses, he emphasized. Other areas requiring attention are conveyor belts, clamshells, and other mechanical equipment. It is necessary to keep spare parts at hand to minimize time losses in case of a breakdown, he said, and of course, good housekeeping efforts contribute greatly to the prevention of losses. A safety program is also an important part of such an effort, it was pointed out.

Bagging operations, Mr. Spillman said, are key factors in material loss; either from spillage or from weighing devices which may allow too much overweights in each bag. He emphasized again the importance of keeping scales in good mechanical working order to avoid errors in either overweights or shortweights. To illustrate the magnitude of loss in even small overages, Mr. Spillman presented a chart (Table 2), showing that an overage of only 4 oz. per 80 lb. bag amounts to 31.25 tons loss out of 10,000 tons shipped in 250,000 bags. An overage of 16 oz. brought the figure to 125 tons loss. At the rate of 50,000 tons shipped, loss from ¼ lb. overweight per bag came to

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TABLE 1—U.S. Nitrogen Consumption

Thousands of Tons of N (Source—Arthur D. Little)

	1955			1964		
	Direct Application	In Solid Fertilizers	Total	Direct Application	In Solid Fertilizers	Total
Anhydrous Ammonia	289.6	133.3	422.9	903	434	1,337
Aqua Ammonia	37.5	....	37.5	86	....	86
Nitrogen Solutions	38.3	350.6	388.9	291	577	868
(Mixtures)						
Total	365.4	483.9	849.3	1,280	1,011	2,291

TABLE 2—Excess Weights in Bagging Operations

Tons Shipped	Number of 80-lb. Bags	¼ Lb. Tons	½ Lb. Tons	¾ Lb. Tons	1 Lb. Tons
10,000	250,000	31.25	62.50	93.75	125
20,000	500,000	62.50	125.00	187.50	250
30,000	750,000	93.75	187.50	281.25	375
50,000	1,250,000	156.25	312.50	468.75	625

NPFI OFFICERS—Newly-elected officers of the National Plant Food Institute, selected by the Board of Directors at the recent convention are, left to right: Paul T. Truitt, president; William S. Ritnour, treasurer; Louis H. Wilson, secretary and director of information; J. D. Stewart, Jr., president, Federal Chemical Co., Louisville, Ky., chairman of the board of directors; W. R. Allstetter, vice president, and John W. Hall, president, Potash Company of America (Denver, Colo.), vice chairman of the board of directors. The NPFI convention was at the Greenbrier Hotel, White Sulphur Springs, W.Va. June 12-15. Full report of marketing phase of meeting appeared in Croplife issue of June 20; production phase of discussions is reported fully elsewhere in this issue.

INDUSTRY PERSONNEL NEWS

Olin Mathieson Posts

NEW YORK—Dr. Herman A. Bruson has been named vice president for research of the chemicals division, announced Stanley de J. Osborne, president of Olin Mathieson Chemical Corp.

Dr. Bruson, who was formerly director of research, organic chemicals, will report to the division general manager's office.

Twelve additional appointments were made in the division's research operations. They are:

J. B. Andrews, administrative services manager; W. I. Denton, director, engineering services department; Dr. J. V. Karabinos, director, organic research department; Dr. D. W. Kaiser, manager, special chemicals section of the organic research department.

Also Dr. A. E. Ardis, director, polymers research department; Dr. B. H. Wojcik, director, inorganic research department; Dr. A. Pace, Jr., assistant director of the inorganic research department; M. C. Metziger, director, inorganic research department at Joliet, Ill., and C. S. King, associate director.

Also Dr. R. M. Thomas, director, industrial chemicals applications research department; Dr. C. M. White, manager automotive chemicals section of that department; Dr. C. W. MacMullen, director, special chemicals applications research department.

●

Heads Buell Engineering

NEW YORK—Jack L. Schumann has been elected president and a director of Buell Engineering Co., Inc., producer of industrial dust and air pollution control equipment, announced R. F. Palyter, chairman of the board. Mr. Schumann succeeds J. A. McBride, who will continue as a board member and consultant.

Mr. Schumann joined the Buell organization in 1946, as a sales engineer. Ten years later, he joined Vitro Engineering Co., and subsequently served as vice president.

Joins Velsicol Staff

CHICAGO—Velsicol Chemical Corp. has announced the appointment of Dr. Warren H. Zick as agronomist-herbicide specialist in the company's research and development department. In his new position, Dr. Zick will be responsible for the coordination of biological aspects of research and development on new products. Dr. Zick attended the University of Wisconsin where he received his B.S., M.S. and, in 1956, his Ph.D. degree. He was formerly with the U.S. Borax Research Corp. where he served as an agronomist, herbicide specialist and plant nutritionist.

Dr. Warren H. Zick

●

Cyanamid Sales Manager

NEW YORK—The promotion of John H. Howard to sales manager for the agricultural division of American Cyanamid Co. effective July 1 was announced by Edward H. Smythe, divisional marketing director.

John H. Howard

Mr. Howard was formerly regional manager for the midwest region. In addition to sales responsibilities for all Cyanamid animal and plant industry products, he will also be responsible for sales training.

In 1955, Mr. Howard joined American Cyanamid and served as sales manager responsible for the national sales of Acronize. Previous to joining the company, Mr. Howard's background was in accounting and food product sales.

Named to replace Mr. Howard as midwestern regional manager is Dr. Max J. Harvey.

●

Allied Names Manager

NEW YORK—Thomas W. Collins, Jr., has been named manager of agricultural chemical sales for Allied Chemical's general chemical division, said John L. Damon, director of agricultural chemicals.

With the division 25 years, Mr. Collins was agricultural chemical production supervisor prior to becoming assistant sales manager in 1951. Earlier he served as chief chemist of general division agricultural chemical plant at Baltimore.

An alumnus of the University of South Carolina, Mr. Collins holds an M.S. and a B.S. degree in chemistry.

●

Named Sales Manager

RICHMOND, VA.—John L. French, a fertilizer salesman and manager for more than 30 years, has been named general sales manager for the fertilizer division at Virginia-Carolina Chemical Corp.

John L. French

Mr. French succeeds A. P. Gates who recently was elevated to vice president.

The appointment marks the highlight of a 33-year career during which Mr. French served Virginia-Carolina in every possible sales capacity. He was a salesman out of Memphis, Tenn.; assistant sales manager in Memphis; district manager in Shreveport, La., and regional manager out of Albany, Ga., for the entire South.

For the past two years, he was assistant to Mr. Gates, then general sales manager.

●

Promoted by Cyanamid

NEW YORK—American Cyanamid Co. has named Max J. Harvey midwestern regional manager for its agricultural division. Edward H. Smythe, marketing director for the division, said that Dr. Harvey replaces John H. Howard, recently named national sales manager of all Cyanamid agricultural products. Dr. Harvey joined Cyanamid in 1950.

●

To Manage Operations

BALTIMORE — Appointment of Edward H. Sullivan as manager of Davison's Fort Pierce, Fla., operations, effective July 1, 1960, was announced by W. N. Watmough, Jr., vice president, Davison Chemical Division, W. R. Grace & Co.

Mr. Sullivan, a native of Fort Pierce, graduated from the University of Florida with a B.S. in agriculture and has been with the Grace organization since November, 1950. He has been sales manager at Fort Pierce since 1954.

●

Named Omaha Manager

RICHMOND, CAL.—R. C. Yapp, district manager for the California Spray-Chemical Corp. for the Midwest, recently announced the appointment of Victor G. Ruh as branch manager at Omaha, Neb. He will be responsible for Calspray operations in Nebraska and Iowa.

Mr. Ruh has been with the company for nine years, serving as a sales representative and branch manager in Wisconsin, Michigan and Illino's following his graduation from the University of Wisconsin in 1951 with a bachelor of science degree.

●

To Supervise Research

MILWAUKEE, WIS.—Dr. John I. Slaughter has been named supervisor of chemical research in Allis-Chalmers research division.

Before joining Allis-Chalmers, Dr. Slaughter was with Corning Glass Works, Corning, N.Y., and Standard Oil of Indiana, Whiting, Ind. He received his B.S. and Ph.D. degrees in physical chemistry from the University of Wisconsin.

●

Fuller Promotes Three

CATASAUQUA, PA.—Announcement of three executive promotions at Fuller Co., Catasauqua, a subsidiary of General American Transportation Corp., Chicago, was made by Channing O. Davis, president.

They are: C. C. Kaesemeyer, former general sales manager, appointed executive vice president, sales; Donald S. Douglass, former assistant general sales manager, to vice president, division sales coordination and Jack L. Prather, former patent attorney and legal counsel at Fuller, to assistant to the president.

●

Stauffer Appointment

NEW YORK—Wyman L. Taylor has been promoted to the position of assistant to the vice president-sales, industrial chemicals division, Stauffer Chemical Co. Mr. Taylor was previously western sales manager, industrial chemicals division and was located in San Francisco. He will now be headquartered in New York. Mr. Taylor is a chemical engineering graduate of the University of California. He joined Stauffer in 1946.

Wyman L. Taylor

●

Transferred to Chile

HAZLETON, PA.—Dorr-Oliver, Inc., has transferred Robert E. Hochscheid from Johannesburg, South Africa, to a newly established office at Bandera 227, 50 Piso, Santiago, Chile, as technical representative. He has assumed this new post after a brief return to the U.S. and will serve Dorr-Oliver customers in Ecuador, Bolivia, Peru and Chile.

Mr. Hochscheid is a graduate of the Colorado School of Mines, 1948, and joined the Dorr Co. (one of the predecessors of Dorr-Oliver, Inc.), in the same year as a metallurgical engineering trainee.

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PRODUCTION LINE — Cotton States Chemical Co., Monroe, La., boasts modern pesticide plant for making both liquids and dry formulations. At left workers fill and weigh 30 and 55-gal. drums with insecticide intended for use on cotton. Fork lift truck is used for stacking drums or loading them onto transport trucks.

Louisiana Pesticide Firm Utilizes Modern Methods

By JESS BLAIR
Special Croplife Writer

Many insecticide dealers in Louisiana, southern Arkansas or the Delta region of Mississippi are familiar with the Cotton States Chemical Co. brand. And many of these dealers are handling the products which are brought to them by the company's four large trailer type trucks.

In business since August Petrus established the firm in Monroe, La., back in 1947, the Cotton States Chemical Co. has kept pace with the trend toward modern farming. At one time the output consisted of 90% dusts and 10% liquids.

"That has been reversed now," said Richard Petrus, production manager and son of the president. "Now our dust plant is not operating at full capacity. Most of the work is in the liquid plant. Liquids are easier to apply and farmers think they are more effective, at least in this humid area."

The firm buys raw materials from several large manufacturers and blends the products at the plant. Dusts are shipped in bulk, while the liquids come in railroad tank cars. Practically all the latest insecticides are made at the plant.

"One of our main problems is to keep up with the latest research," said the younger Mr. Petrus. "Insecticides are becoming more powerful each year, and part of our job is to acquaint dealers and farmers with the latest products."

In working with dozens of dealers in the tri-state area, Cotton States Chemical has devised an educational program. Each dealer is visited once a week during the busy season, where he is briefed on the materials, how they are to be used and also methods of selling are discussed.

"Competition is strong in this area," said Mr. Petrus, "so the selling is equally as important as making the insecticides."

One way of acquainting farmers with new products is the test plot method. The firm induces influential farmers in several areas to try the new products, with a record being kept on the effectiveness. This not only helps the company keep check on the worth of its products, but it brings them a lot of good advertising.

The busy season for the firm starts in May and lasts till September. During this time the company has about 25 employees in addition to the office force. After September many of the workers are laid off till the next spring, except for the few who are kept on for repair and building work.

"We do line up dealers and get in a lot of preparatory work," said Mr. Petrus, "but you might say this is a seasonal business."

In addition to Mr. Petrus and Richard, there are two more members of the supervisory crew. Another son, Charles, is sales manager, while Paul Betts is general manager. Mr. Petrus maintains an office at his seed company in West Monroe, so many of the insecticide operations are carried out by the three younger men.

The firm has two manufacturing plants in adjoining buildings, a small office building and a laboratory.

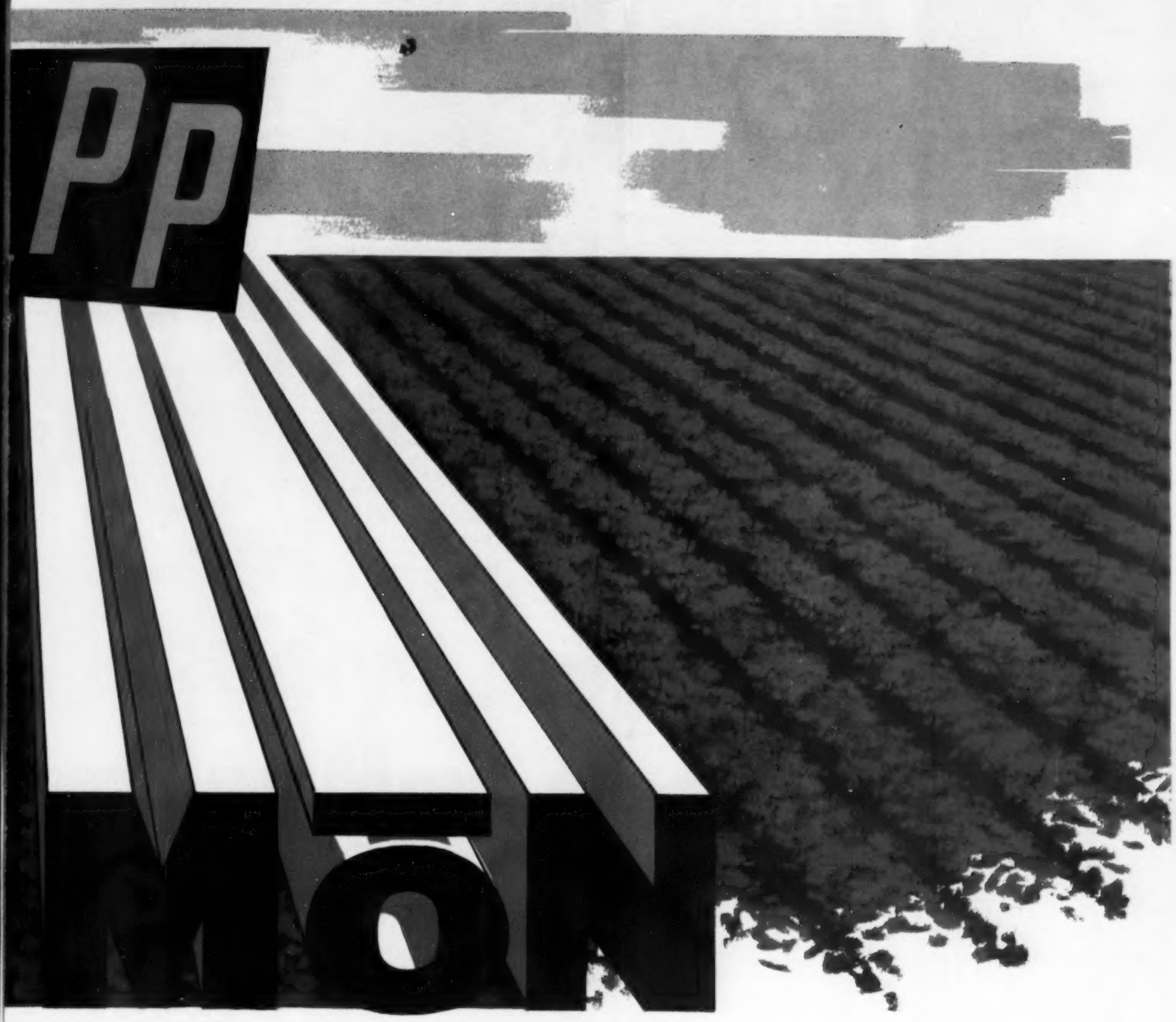
Since liquid insecticides are selling more readily, most of the expansion has been in this plant. Using a crew of several workers at the filling line, the plant is capable of turning out 5,000 gallons a day. This is sold in 55-gal. and 30-gal. drums and in five-gal. cans. During the last few years the firm has been using one-gal. and one-qt. sizes, in order to catch the suburban and garden trade.

Dusts are usually sold in 50-lb. sacks. However, the company also puts out a 10-lb. bag. This is also slanted to the customer who has a garden or lawn and wants only a small quantity.

"Insects seem to be on the increase," said Richard Petrus, "or maybe people are getting more aware of the crop losses to boll weevils, boll worms, thrips, aphids and all the others in this cotton and corn growing area.

"One thing we try to stress to our dealers and farmers is that the methods and time of application are almost as important as the products themselves. This requires an ever-increasing educational campaign on our part. Without it, our sales would be dropping instead of increasing."

MODERN LABORATORY—Richard Petrus, production manager of Cotton States Chemical Co, is shown in the company's laboratory where all raw materials and finished formulations are tested daily.



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PRODUCTION PROCESS PATENTS

2,942,035

Preparation of Benzene Hexachloride. Patent issued June 21, 1960, to Franklin Strain, Norton Center, and William E. Bissinger, Akron, Ohio, assignors to Columbia-Southern Chemical Corp. A method of preparing benzene hexachloride which comprises reacting chlorine and benzene in liquid phase and in the presence of isopropyl peroxydicarbonate.

2,941,922

Insecticidal Compositions. Patent issued June 21, 1960, to Philip Gerolt, Herne Bay, England, assignor to Shell Oil Co. An insecticidal composition comprising an intimate homogeneous mixture of a chlorinated polycyclic compound selected from the group consisting of aldrin, isodrin, dieldrin and endrin, and an asphaltite, the ratio of said asphaltite to said polycyclic compound ranging between 1:2 and 5:1.

2,941,959

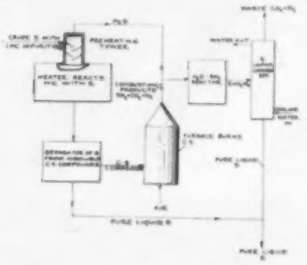
Activation of Clay by Acid Treatment, Sand Aging and Calcination. Patent issued June 21, 1960, to Ernest W. Greene and Aldo P. Allegrini, Westfield, N.J., assignors to Minerals & Chemicals Corp. of America, Menlo Park, N.J. A method for the preparation of adsorptive contact masses from clay comprising the steps of: mixing the clay with sulfuric acid; aging the mixture in silica sand to permit reaction between the clay and the acid; separating the aged material from the silica sand; and, without leaching any of the water soluble components from the aged material, calcining the said material to eliminate sulfate therefrom.

2,939,781

Pelleting of Nitraphosphate Fertilizer. Patent issued June 7, 1960, to George R. Gilliam, Prince George County, Va., assignor to Allied Chemical Corp., New York. A continuous process for preparing a nitraphosphate fertilizer consisting of spherical particles containing at least 30% plant food of which 38-55% is N, 12-42% is K_2O and the residue is P_2O_5, and 95% of said particles having a size range of 8-35 mesh Tyler screen size, which process comprises treating phosphate rock with a mixed acid consisting of nitric acid and acid selected from the group consisting of sulfuric, phosphoric and mixtures thereof in the proportions of from 7 to 20 equivalents of mixed acid per mol of P_2O_5 in the rock, said mixed acid selected to give a ratio of about 1 mol of PO_4 and SO_4 to 1 mol of CaO in the rock, the acidulation of the rock being carried out in the presence of water in an amount from about 15% to about 40% by weight of the total mixture, ammoniating said acidulated material employing from 2 to 4 mols of ammonia per mol of P_2O_5 from the phosphate rock plus additional ammonia to neutralize the acid used in excess of that needed for solubilizing the rock, incorporating potassium chloride in the ammoniated material in amount required to furnish 12-42 parts of K_2O for each 38-55 parts of N in the ammoniated material and maintaining sufficient water so that the final ammoniated slurry, including added potassium chloride, contains 14-40% water by weight, by addition of water if required, evaporating the slurry so formed at 120-180°C. to form a slurry having a water content of less than 6% water and a liquid phase of at least 45% at evaporation temperature, said evaporation being conducted in an evaporator where it is subjected to vigorous agitation, maintaining the temperature at 120-180°C., dispersing the concentrated slurry into a gaseous atmosphere in the form of droplets, cooling said droplets in said atmosphere to form pellets, and collecting said pellets.

2,949,868

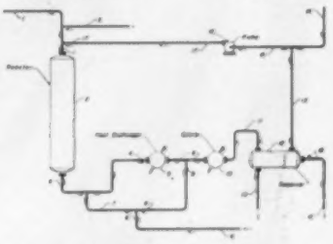
Purification of Pure Sulfur. Patent issued June 21, 1960, to Vas Hubert Brogdon, Jr., Port Sulphur, and Edward W. Olsen, Houma, La., assignors to Freeport Sulphur Co., New York. Process for the production of substantially purified elemental sulfur from crude and other impure sulfurs containing hydrocarbon impurities which comprises heating the impure sulfur to a temperature causing reaction of the hydrocarbons with sulfur thereby producing insoluble carbon-sulfur compounds which remain in the liquefied sulfur obtained



and hydrogen sulfide gas which separates out, separating the elemental sulfur from the carbon-sulfur compounds in the sulfur liquid, heating and converting substantially all of the insoluble carbon-sulfur compounds into gaseous compounds of sulfur, by a procedure which includes burning at least part of the carbon-sulfur compounds with the addition of oxygen to form sulfur dioxide mixing together and reacting the H_2S gas and any gaseous carbon-sulfur compounds formed, with sulfur dioxide formed by said combustion of at least a part of the carbon-sulfur compounds hereinbefore specified, thereby producing elemental sulfur which, when added to the sulfur already separated, constitutes substantially all of the sulfur content of the impure sulfur initially treated.

2,938,851

Preventing Corrosion of Plant Equipment. Patent issued May 31, 1960, to Russell F. Stedman, Des Plaines, and Ralph B. Thompson, Hinsdale, Ill., assignors to Universal Oil Products Co., Des Plaines, Ill. A method of reducing corrosion of plant equipment in a reforming process utilizing a platinum-containing catalyst,



wherein hot effluent reactor products contain a corrosive chloride compound and wherein a hydrogen stream separated from said effluent products is recycled to said reactor, which comprises partly cooling said effluent products to a temperature of from about 500°F. to about 700°F., admixing ethylene diamine and water with said partly cooled effluent products, thereafter further cooling the effluent products to below 400°F., separating therefrom a hydrogen stream substantially free of said ethylene diamine, recycling said hydrogen stream to said reactor, and separately withdrawing liquid effluent products and a water fraction containing ethylene diamine hydrochloride.

2,941,873

Preparation of Sulfur. Patent issued June 21, 1960, to David Brown and John W. Colton, New York, assignors to Scientific Design Co., Inc. An apparatus for concentrating solutions comprising an autoclave, a depending baffle disposed in said autoclave, dividing said autoclave into

Turn to PATENTS page 19

Arcadian® News

Volume 5 | For Manufacturers of Mixed Fertilizers | Number 7

Technical Tips to Help You Save Money

Efficient Ammoniation Puts More N in N-P-K

Production of high-analysis, high-nitrogen mixed fertilizer becomes most economical when all the superphosphate in the mix is ammoniated at the highest practical rate of ammoniation. With ARCADIAN® Nitrogen Solutions, most standard production procedures can easily be adapted to use about 6 pounds of ammonia per unit of finely divided 20% superphosphate, and from 3 to 3.5 pounds of ammonia for triple superphosphate. Keep in mind that one pound of ammonia will neutralize 3.71 pounds of 60°Be (77.67%) or 3.09 pounds of 66°Be (93.19%) sulfuric acid. Of course the very best production performances that yield absolutely maximum benefits may slightly exceed the above ammonia to superphosphate ratios.

Sulfuric Acid gives Higher Heat

In producing pulverized, semi-granulated and granulated fertilizer, it is often desirable to obtain higher temperatures in the mixer than would normally result from getting maximum ammoniation of superphosphate. The usual way to obtain this higher heat is through introduction of sulfuric acid. Indeed, the very high affinity of ammonia for acids assures this heat build-up before much of the ammonia has had a chance to react with the superphosphate. For example, a pound of ammonia reacted with sulfuric acid will generate about 2940 BTU's of heat in contrast to 1540 BTU's from reaction with triple superphosphate alone, and only 1460 BTU's with 20% superphosphate.

But this Heat is Costly

However, too many operators are prone to build up mixer heat with sulfuric acid without regard to the higher cost involved. Before embarking on a long-range program with sulfuric acid it would be wise to explore all other possibilities for getting the same result, such as better performance in the dryer. This alternative becomes even more attractive when you consider that heat produced by the chemical action of sulfuric acid *may cost 5 to 10 times as much* as dryer-produced heat by means of common fuels such as oil or gas.

Look to Your Procedures

Experience has shown that where equipment and techniques fail to perform in accordance with indicated levels, it is not usually the chemistry and mathematics that are at fault but something in the process itself.

For example, frequent cause of failure to derive the most economical results from ammoniating solutions is the formation of pellets, or large plastic masses, before all of the ammonia has been added to the mix. This reduces the surface area exposed to ammoniation, as well as enclosing some superhosphate, and conceivably acid, within the larger pellets —beyond reach of the ammonia. This leads to wasteful use of acid and loss of nitrogen—whether it occurs in granulated or pulverized fertilizer, in batch or continuous mixer.

Another cause of failure is the indiscriminate use of excess amounts of acid. This can result in loss of nitrogen even though the original intention was to retain a higher portion of the ammonia input.

Four Things to Watch

Number one is proper introduction of nitrogen solution to assure intimate contact between superphosphate particles and the ammonia. It has become axiomatic in the industry that best ammoniation results are impossible without this all-important contact. It has also been found that operators cannot count on reclaiming much of the ammonia if it has not made proper initial contact with the superphosphate.

The second thing to watch in your procedure is your introduction of sulfuric and phosphoric acids. Too many producers are not fully aware of the importance of distributing these acids thoroughly throughout the mass at the time of ammoniation. The fact is, that if ammonia is applied in small areas of the mix at excess rates, some ammonia is bound to escape, particularly at the

(continued on following page)

(continued from preceding page)

higher rates of ammoniation where volatilization occurs quite rapidly.

Thirdly, keep an eye on overloads in continuous ammoniating systems. Overloading in tons per hour per foot of ammoniating distributor pipe is quite common with continuous ammoniating systems. Serious enough in itself, the problem assumes even greater proportions when recycle is taken into account. In view of this, any remedial suggestion that may shorten the effective ammoniating region will naturally be resisted by the experienced operator. However, where this overloading is causing premature granulation which seriously affects the product, it is well worth trying to apply the acid in the continuous mixer a little ahead of the final portion of ammonia. Another approach to solving overload problems is to increase recycle wherever it is not already excessive. Or the use of 66°Be sulfuric acid may be advisable. Again, reduction of hold-up time in the mixer during ammoniation can also be tried, where practical.

The fourth item to watch is the operation of distributor pipes. If improperly designed, or if some parts are badly worn or corroded, excessively large volumes of solution, acid, water or steam may be introduced into small areas of the mix. This always means trouble.

Batch Mix Remedies Simpler

While the principles of good ammoniation remain the same with rotary batch mixers, avoiding and correcting problems is much simpler. It is relatively easy to design distributor pipes for the job at hand. And it's equally simple to make daily pipe inspections. In addition, the timing of introduction of acid (when used) and ammoniating solution can be regulated to a fine point—ranging from simultaneous to any desired delay interval.

Where the formation of undesired pellets becomes a problem in rotary batch mixers, keeping the flights clean to assure rapid discharge invariably helps. Avoid any dripping of liquids after valves have been closed. Be sure that all acid is in the mass and well distributed before all of the ammonia is applied.

If you need information specific to an ammoniation problem in your plant. Nitrogen Division technical men will be only too happy to help. Contact: Technical Service, Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.

Tissue tests show the farmer he needs more and better fertilizer.

Using Tissue Tests to Sell Fertilizer

Crops must have an adequate supply of needed nutrients *within the plant* to make vigorous growth and produce high yields. The best way to prove that yields are limited by plant food hunger is to test the nutrient content of the plants. This can be done efficiently and economically by on-the-spot tissue tests.

When you show a farmer, by tissue tests in his field, that his plants are deficient in certain nutrients, you present an excellent case for the use of more and better fertilizer. Tissue testing *now* can help you sell a bigger tonnage of better fertilizers for future crops—fertilizers that are more profitable to you and to farmers.

Tests Reveal Facts

Tissue tests graphically portray the fertilizer needs of crops. In a Missouri survey, tissue tests in 125 corn fields showed that 58% of the fields were deficient in nitrogen, 30% were deficient in phosphorus, and 26% were deficient in potash.

Tissue tests reveal the true reason for low yields. Last spring, some North Carolina farmers complained about the poor performance of nitrogen on small grains. Tests showed that this was due to a lack of potassium and magnesium. The farmers were depending on carry-over from previous row crop fertilization to supply phosphorus and potash requirements. In only one instance out of 20 to 30 cases had a complete fertilizer been applied to the grain at planting time.

Summer Selling

Many fertilizer salesmen have discovered the fact that tissue tests are real salesmakers! The first day one salesman used a tissue test kit, he sold an additional 30 tons of nitrogen. His tests proved that a 2-1-1 ratio would have been a better ratio to use in the corn field he visited.

Tissue testing is a profit-producing job for your salesmen during the slack season in July and August. This is the right time to test most crops for plant food deficiencies. On-the-spot tests made now in farmers' fields will show them the plant food needs of their crops. Tests are scientific and believable. The right

fertilizer for the crop ceases to be a matter of personal opinion. The farmer can see what is needed by the results of the test. When he sees what is needed, he is ripe and ready to place an order and he is grateful to your salesman for making the test.

Where to get Test Kits

It will pay you to equip your salesmen with tissue test kits and get them out into the field making tests and making sales. Of course they should learn how to make tests before they start. They can study directions and try it a few times... and get the advice of an agronomist. Tissue test kits can be obtained from: Tissue and Soil Test Kits, Department of Agronomy, Purdue University, Lafayette, Ind.; or Denham Laboratory, Denham Springs, La.; or Urbana Laboratories, Urbana, Ill.

Write Nitrogen Division

If irrigation is used in your area, tissue tests are a valuable aid in selling fertilizer for use in irrigation water. Write to Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y., and ask for as many copies as you need of "How to Apply Fertilizer in Irrigation Water." These will be sent to you without charge or obligation. You can also ask any Nitrogen Division agronomist for some pointers on the use of tissue tests on both irrigated and non-irrigated crops.

It Pays to Sell More N in N-P-K

Practically all our large-acreage crops except legumes need more nitrogen than any other plant food. That is the economic reason why use of nitrogen has increased faster in the last 15 years than use of phosphorus, potash or other plant foods.

You can sell more nitrogen, and get more for it, by pushing high-nitrogen mixed fertilizers such as 15-10-10, 16-8-8, 14-7-7 and 12-6-6. You'll get the entire sale in one deal when you supply all the major plant food needs of the crop in one package. And in the long run too, you'll gain good will because you are providing what farmers really need—balance in plant food application.

Saves Farm Work

When farmers apply fertilizer that provides N, P and K in the right balance for their crop, they can't forget to do the job right. Every year, somewhere, an important acreage of farm crops does not get the nitrogen side-dressing or top-dressing needed to make the crops do their best. Bad weather and the rush of other work prevent getting the job done. Sell high-nitrogen mixed fertilizers and you protect farmers from this constant problem, and put more profit in your own pocket.

N for Cash Crops

Corn, wheat, cotton, sugar beets, most vegetables and fruits—by far the majority of cash crops—need more nitrogen than other plant food. Now that high-nitrogen mixed fertilizers are so concentrated, farmers can apply all the fertilizer needed for high yields in one or two applications, pre-plant or in the planter. The new-style planters that place the fertilizer to one side and deeper than the seed make it easy to use large amounts of fertilizer in the row without seed damage.

Feed Crops Too

About 80 percent of all our harvested crop acreage goes into livestock feeds. These fields, along with millions of acres of unplowed range and pasture, make livestock feed the biggest crop market by far.

Most hay silage and grazing crops need high-nitrogen mixed fertilizer in 2-1-1 or even 3-1-1 ratio to produce the largest amounts of high-quality feed, containing the most protein and other digestible nutrients. You do livestock farmers a favor by selling high-nitrogen balanced fertilizer for top-dressing.

Better Feed Value

Grain crops, too, are largely used for feed. Results on many farms show that corn, wheat, barley, oats and milo all need more nitrogen than any other plant food to produce big yields. The high-nitrogen fertilizer also increases the protein content of many grains, and thus increases the feed value of the crop two ways.

Many crops still don't get enough fertilizer of any kind. It is easier to show skeptical farmers the profits fertilizer can make for them if you sell them fertilizers balanced to the needs of their crops. When you sell more N in N-P-K you put more profits in the bag for the farmer... and for yourself.

Pre-reactor Process Popular in Midwest

The new pre-reactor process for producing high-analysis, high-nitrogen mixed fertilizers is rapidly gaining in popularity among manufacturers in the Midwest. They are using this process to meet the growing demand for high-nitrogen fertilizers for corn and other crops.

The use of 2-1-1 and 3-2-2 ratios is increasing. Probably the biggest gain this year will be in consumption of 16-8-8 and 15-10-10. Not many years ago, it was difficult to produce 2-1-1 and 3-2-2 ratios. But, new developments in methods and materials have made high-analysis ratios easy to manufacture.

This is the first full season that some Midwest manufacturers have used the pre-reactor process. Results have been phenomenal. Manufacturers are now able to produce high-analysis, high-nitrogen fertilizers with the same ease and confidence with which they made low-nitrogen fertilizers in the past.

Ask Nitrogen Division

The pre-reactor process enables you to produce high-nitrogen fertilizers with *all* the nitrogen derived at low cost from ARCADIAN® Nitrogen Solutions. It also offers many other outstanding advantages. The cost of adding a pre-reactor system to a complete granulating plant is surprisingly low. It will pay you to get all the facts. Contact Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.

HERE'S THE BIG LINE OF Arcadian® NITROGEN SOLUTIONS

When you purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen products on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

	CHEMICAL COMPOSITION %						PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60° F	Approx. Vap. Press. at 104° F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	15
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.184	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.050	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
6C	43.0	20.0	68.0	6.0	6.0	9.3	1.180	12	39
6M	44.0	22.0	66.0	6.0	6.0	10.0	1.158	17	14
10	44.4	24.5	56.0	10.0	9.5	11.0	1.114	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.087	25	- 7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
15	44.0	28.0	40.0	15.0	17.0	12.7	1.052	29	1
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.932	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.978	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	24.3	0.618	211	-108

Other ARCADIAN® Products: URAN® and FERAN® Solutions • Ammonia Liquor • N-dure® A-N-L® • Ammonium Nitrate • UREA 45 • Nitrate of Soda • Sulphate of Ammonia

NITROGEN DIVISION

MAIN OFFICE: 40 RECTOR ST., NEW YORK 6, N. Y., PHONE HANOVER 2-7300

Allied Chemical

Hopewell, Va., P. O. Drawer 131 — Glenview 8-6301
Ironton, Ohio, P. O. Box 98 — Drexel 7-4366
Omaha 7, Neb., P. O. Box 166 — Bellevue 1464
Raleigh, N. C., 606 Capital Club Bldg. — Temple 3-2801
Columbia 1, S. C., 1203 Gervais St. — Alpine 3-6676
Atlanta 3, Ga., 127 Peachtree St., N. E. — Jackson 2-7805
Memphis 9, Tenn., 1929-B South 3rd St. — Whitehall 8-2692
Columbia, Mo., 1134 Highway 40W — Gibson 2-4040
Indianapolis 20, Ind., 6060 College Ave. — Clifford 5-5443
Kalamazoo, Mich., P. O. Box 869 — Kalamazoo 5-8676
St. Paul 14, Minn., 764 Vandalia St. — Midway 5-9141
San Francisco 4, Cal., 235 Montgomery St. — Yukon 2-6840

Sets Triple Damages Against Failure to Meet Label Guarantees

CONCORD, N.H. — The New Hampshire Department of Agriculture has announced that it will establish the same values on plant food in 1960 as were in effect in 1959 as the basis for assessing triple-damage penalties against any fertilizer products sold in the state which are found to be lower than guarantees, after consideration of the allowed tolerances.

The commissioner of agriculture is charged by New Hampshire law with establishing these values each year, and once established, they remain in effect throughout the year, regardless of any changes in fertilizer prices that might apply.

The statute provides for triple damage assessment against any products found to be in violation of formula guarantees. For 1960 the unit value of nitrogen in the formula will be $3 per unit, or 15¢ lb.; phosphoric acid, $2 per unit, or 10¢ lb.; potash, $1.20 per unit, or 6¢ lb.; magnesium oxide, $1.25 per unit, or 6¢ lb., and borax, $1.20 per unit, or 6¢ lb.

The triple indemnity program was started in New Hampshire in 1956, when assessments totaled $301, according to George H. Laramie, control supervisor. In 1957 the assessments were $582, increasing to $1,600 in 1958 and $1,422 in 1959.

Cyanamid Studies Question of Doubling Phosphoric Acid Output

NEW YORK—Corporate approval for an engineering study of the feasibility of doubling phosphoric acid production was announced June 15 by C. D. Siverd, general manager of American Cyanamid Company's agricultural division. Final decision on the project will not be made until completion of the study.

"This is part of Cyanamid's long-range program to make ever-increasing supplies of essential plant food available for agriculture, especially in the heavy crop-producing areas of the southeast and midwest," Mr. Siverd said. "The high analysis—54% P_2O_5—of phosphoric acid makes this an economical source of phosphorus in mixed fertilizers."

NEW TANK CARS

CHICAGO — Union Tank Car Co. has started construction of 12 more of the new 30,000 gallon capacity railroad tank cars it introduced earlier this year. The new "Hot Dog—30" cars, largest capacity railroad tank cars in the world, are 85 ft. long.

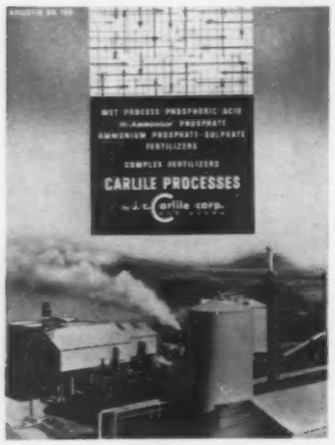
SAFETY AWARD—The Smith-Douglass Co., Inc., in Albert Lea, Minn., recently received a plaque from the National Safety Council honoring their outstanding safety record. As the sign shows, the plant has been 1,500 days without a lost time accident. M. A. Glass, right, plant manager, presents the award to Gordon Lilliefloren, second from right, head of the employee safety committee, while other members of the committee observe.

WHAT'S NEW IN PRODUCTS · SERVICES · LITERATURE

To obtain more information about items mentioned in this department simply: (1) Clip out the entire coupon in the lower corner of this page. (2) Circle the numbers of the items of which you want more information. Fill in the name and address portions. (3) Fold the coupon double with the return address portion on the outside and fasten the edges with a staple, cellophane tape or glue. (4) Drop in the mail box.

No. 9215—Plant Bulletin

A brochure, illustrated with photographs of existing plants, describes the Carlile process for production of wet process phosphoric acid and ammonium phosphate fertilizers, including di-ammonium. Plant construction utilizes sectionalized design which, the company says, provides simplicity and economy. Schematic flow diagrams show the step-by-step production of phosphoric



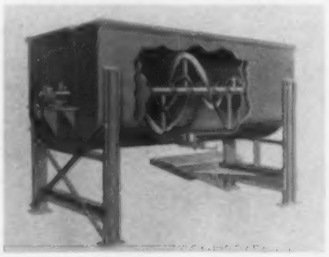
acid and ammonium phosphate for fertilizers, including complex fertilizers. Plants described in the text range in capacities from 30 tons a day of P_2O_5 to 200 tons a day; and from five tons an hour of high analysis ammonium phosphate to 25 tons an hour. Data included will act as a guide for new installations as well as increasing capacities of existing installations by sectionalizing. For copies of the bulletin, check No. 9215 on the coupon and mail.

No. 9218—Ammoniating Solution

A new ammoniating solution is now being offered by E. I. du Pont de Nemours & Co. Called Du Pont "Uramon" Ammonia Liquor-K (UAL-K), the solution contains 40% nitrogen. The conditioning advantages, according to the company, are provided by methylene ureas which minimize bag caking and improve handling properties on the farm. Successful commercial trials with large quantities of pulverized 5-10-10 have demonstrated the practical value of the product, the company says. Other advantages listed include the cooling effect of ammonium carbamate, relatively low gauge pressure and low corrosion characteristics. In addition to pulverized mixtures, it can also be used for making high quality granulated mixtures with more uniform granules. For more information, check No. 9218 on the coupon and mail.

No. 9216—Ribbon Blenders

A line of ribbon blenders featuring automated control and pre-engineering is available from Tower Iron Works. Designed specifically for accurate blending of powders, pastes and liquids, the blenders are pre-engineered to reduce initial cost and custom service to insure suitability to specific requirements, the company says. With the automatic program control board all auxiliary



equipment for the cycle can be set into operation individually or in sequence. Another feature is the "Tri-Mix" action. This development, the company says, combines self-reversing flow with top to bottom turnover assuring perfect blending action without stratification. They are available in four sizes and can be fitted with a choice of four different agitators. For details, check No. 9216 on the coupon and mail.

No. 9220—Carrier, Diluent Bulletin

"Attaclay" carriers and diluents for insecticides, fungicides, herbicides and other dusts and wettable powders are the subject of a bulletin published by Minerals & Chemicals Corporation of America. The four-page, two-color illustrated brochure presents information on this specially processed form of naturally sorptive attapulgas clay which is also used as a grinding aid for pesticide chemicals. The bulletin discusses the ability of the Attaclays to make dry dust bases and wettable powders from watery, sticky or solid chemicals, plus a list of complete chemical analyses and physical properties of these materials. The bulletin also gives application characteristics of these carriers and diluents. For copies check No. 9220 on the coupon and mail.

No. 9217—Plant Safety Kit

A plant safety kit aimed at making materials handling operations safer and more efficient in production, storage and shipping areas, by reminding workers of correct operating procedures related to the use of fork lift trucks, has been released by Towmotor Corp. The kit contains

a pocket-sized operator's guide, four humorous safety cartoons designed for posting on bulletin boards and four large lift truck route posters, each of which displays a different message of caution. The operator's guide outlines basic operating data for fork lift trucks and accessories and shows proper handling techniques for lifting, transporting and stacking. The booklet contains a 30-point safety check list and a 32-point preventive maintenance check list. For copies of the kit, check No. 9217 on the coupon and mail.

No. 9222—Level Indicator Bulletin

How material-level indicators control level of pulverized, fine, crushed or granular material in bin or silo is the subject of a bulletin offered by Fuller Co. The general purpose model (SG-4) and a specially-designed model for hazardous conditions (SG-4X) are discussed. An explanation of the difference between the two models is given and current requirements, control switches and a safety pulse switch covered. A wiring diagram illustrates the operation of the switches. It contains a full-page schematic drawing of a material-level indicator, a photograph of a typical installation of a vertical-mounted indicator and a drawing giving examples of applications. For copies check No. 9222 on the coupon and mail.

No. 9219—Telescoping Conveyor

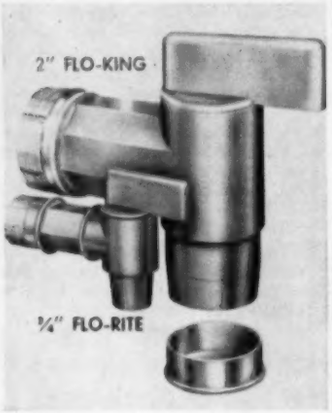
The R. T. Sheehan Co. announces a telescoping conveyor under the trade name of "Tel-Co" which op-

erates in or out by push buttons, without stopping the belt. It is usable in any length from 8 ft. centers to

40 ft. long and is portable in a retracted position. It comes equipped with a 16 in. wide fabric belt running 36 in. above the floor with hinged receiving plate on both ends. The belt runs at a speed upwards to 200 FPM and it telescopes in or out at 100 FPM. It is used for truck loading and unloading, around warehouses and for general plant use. It is powered with single or three phase current. For more information, check No. 9219 on the coupon and mail.

No. 9221—Plastic Drum Faucet

A 2 in. polyethylene drum faucet called the "Flo-King" has been introduced by Multi-Meter Corp. The faucet will empty a 55 gal. drum in a little over two minutes, the company says, and easily handles viscous materials and performs well where rapid drawing of liquids is essential. Instant flow is obtained from a half



turn of the handle and patented vertical ribs inside the spout eliminate dribble or spit. It will not stress-crack or break and it prevents chemical reaction and contamination of all ordinary chemical products stored in drum containers, the company says. It fits all standard 2 in. steel shipping container openings. For more information check No. 9221 on the coupon and mail.

No. 9223—Surfactant Brochure

A brochure listing Witco's line of Emcol surface active agents classified both by use and by chemical

type is being offered by Witco Chemical Co., Inc. Agricultural emulsifiers are covered. For copies check No. 9223 on the coupon and mail.

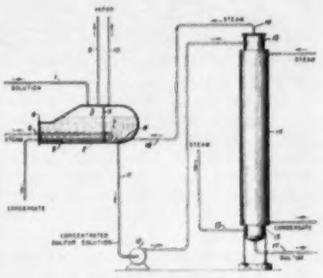
SPENCER STOCK SPLIT

KANSAS CITY, MO.—The board of directors of Spencer Chemical Co. on June 16 declared a two for one stock split-up in the form of a 100% stock dividend on the issued and outstanding common stock of the company payable not later than July 6, 1960, to holders of record at the close of business on June 29, 1960. Payment of the stock dividend was subject to approval of the proposed increase in the authorized common stock of the company from 2,000,000 to 5,000,000 shares by Spencer shareholders.

PATENTS

Continued from page 12

two compartments interconnected below said baffle, said autoclave having an opening in each compartment for



removal of vapor and further having an opening in said first compartment for introducing therein liquid solution to be concentrated, conduit means disposed interiorly and adjacent to the bottom autoclave wall for heating the solution communicably disposed in both interconnected autoclave compartments, pump means for removal of said concentrated solution, a steam stripper for stripping said concentrated solution of volatiles therein and wherein said means for introducing live steam into said second compartment is secured to said steam stripper whereby the stripper steam is introduced into said second compartment.

2,939,815

Insecticide Compositions. Patent issued June 7, 1960, to Louis L. Dettelbach, Jr., Atlanta, Ga., assignor to Orkin Exterminating Co., Fulton County, Ga. An insecticidal composition comprising a solution in a kerosene type mineral oil fraction of a combination of technical heptachlor dissolved in technical chlordane, said kerosene solution containing between about 15% and about 50% of heptachlor by weight.

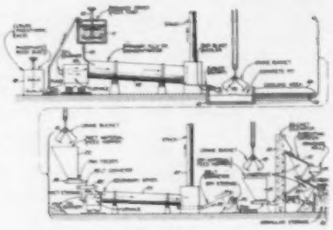
2,939,816

Insect Deterrents Containing Staphisagria. Patent issued June 7, 1960, to Harold L. Trexler, Reading, Pa. The process of internally administering powdered seeds of the staphisagria plant to living subjects including human beings and animals for the purpose of deterring insects from biting said subjects, comprising the step of administering said powdered seeds in limited dosages internally to said subjects each dosage comprising about .00004 grain of staphisagria, at least two hours prior to the anticipated exposure of said subjects to said insects.

2,937,937

Process for Producing Granular Triple Superphosphate. Patent issued

May 24, 1960, to Frank Dunbar, Atlanta, Ga., assignor to Armour & Co., Chicago. In a process for preparing granular triple superphosphate wherein there is first formed a thin, aqueous slurry containing the phosphoric acid and finely-divided phosphate rock to be reacted, the slurry is concentrated, the concentrated slurry allowed to set in a den, and thereafter the denned material is



granulated in a rotary dryer, the improvement comprising interrupting said den setting step at a stage where the denned material is in a flowable, semi-solid condition by removing said material from said den during stage, said material being removed from said den after having been therein for at least about eight hours and before said material has remained therein for over sixteen hours, flowing and spreading the removed material over an extended area to form a bed thereof having an enlarged surface contact with the atmosphere for accelerating the setting of said removed material, interrupting said last-mentioned setting step to obtain a feed for said rotary dryer when the material in said bed has reached the condition of a soft, sticky, non-flowable mud, thereby obtaining a material which can be readily granulated, feeding said soft, sticky, non-flowable mud into a rotary dryer, and forming said mud into a granular product within said dryer.

Chemical Workers' Numbers Increase in California Tally

SAN FRANCISCO — The average number of wage and salary workers in the manufacture of chemicals and allied products in California for April showed a sharp increase over 1959, according to the division of labor statistics and research of the California Department of Industrial Relations.

An average of 39,200 wage and salary workers were employed in the industry in April, compared to 38,500 for April, 1959. The 39,200 average, which may be a new high, can be compared to 38,800 for March. In March of last year, 38,100 persons were employed.

Average weekly earnings of production and related workers in agricultural chemicals in the state dropped from a March figure of $106.52, to $103.28 in April. The April figure was higher than the $100.44 of April, 1959.

There was a decrease in the average hours of the work week, declining from 44.2 hours in March to 42.5. The April figure is slightly higher than the 42.2 of April of last year. Average hourly earnings rose from $2.41 in March to $2.43 in April, compared to $2.38 in April of last year.

Nitrogen Division Announces Price Changes for Urea

NEW YORK—Effective July 1, all agricultural and industrial grades of urea were priced f.o.b. production points rather than on a delivered price basis, Malcolm E. Hunter, sales vice president for Allied Chemical's Nitrogen Division, has announced.

Mr. Hunter explained the change in pricing policy would improve the division's marketing services to customers. Previously, Nitrogen's urea was sold on a delivered price basis.

F.o.b. points will be South Point, Ohio, and La Platte, Neb. Under the new pricing, all grades of Arcadian Urea Fertilizer will be priced at $98 a ton; Procadian Urea Feed Mixture at $100 a ton, and industrial grades Crystal Urea and Uncoated Pelleted Urea at $100 per ton. The delivered cost will be equalized against competitive producing plants.

The division will continue to ship from warehouse stocks with freight charges equalized on the basis of quantity per shipment.

Miller Chemical Licensed For Foreign Distribution

NEW YORK—Union Carbide International Co. has licensed Miller Chemical & Fertilizer Corp., Baltimore, Md., to manufacture and distribute "658" fungicide, a copper-zinc-chromate complex, under all existing foreign patents.

This fungicide has proven effective against diseases including early and late blight on potatoes and tomatoes, downy mildew on cucumbers and melons and several diseases on turf. Current studies are being made to evaluate the effectiveness of "658" fungicide against diseases on coffee, citrus, cocoa and peaches.

Miller's marketing plans include establishing distribution in many foreign countries where the growing of crops requiring fungicidal treatment is practiced. Miller already has distribution in several foreign countries and will establish other outlets where they are not now represented.

NAME CHANGED

WOODLAND, CAL. — Agriform of Northern California, Inc., has changed its corporate name to "Agriform Chemical Co., Inc.," it has announced. The name of Agriform of Northern California will continue to be used as a division of Agriform Chemical, according to D. W. Galbraith, president. The division will cover farm chemical manufacturing, distribution and sales. The turf products division of Agriform Chemical will be charged with distribution and sales of Nitroform and related professional turf products. Other divisions involving overseas affiliations, land development, etc., will be formed as appropriate.

Mr. Galbraith emphasized that the name change in no way affects contracts, commitments or obligations incurred by Agriform of Northern California, Inc. All are binding on the new corporate name, he said. Presently held stock has been called in and will be reissued under the new name. There has been no change in stock ownership or in official positions either in management or the board of directors.

Trans Atlantic Air Shipping Rates Lowered

NEW YORK—Exporters of chemicals to scores of trans Atlantic market areas have been accorded low air shipping rates, as the result of a new tariff filed with the Civil Aeronautics Board by Air Express International Corp.

John E. Muhlfeld, vice president-sales, announced that effective June 30, international shippers in the chemicals industry would be entitled to receive the direct benefits of lower rates as well as of AEIC's Golden Rocket Service which integrates jet transportation with one-waybill, door-to-door shipment, Mr. Muhlfeld said:

"The minimum rate has been reduced to $5, and for the first time, a new specific commodity rate structure established for shipments of chemicals from 24 lb. down to 1 lb., with lower weight breaks set at 25 lb. and 50 lb., in addition to the 100-lb. weight level. This means that shippers of chemicals will not have to wait to assemble their bulk shipments in order to earn AEIC's lower-than-airline rates."

Safety Record Noted By Missouri Firm

JOPLIN, MO.—Farmers Chemical Co. of Joplin, manufacturer of phosphoric acid and of high-analysis ammonium phosphate fertilizers, recently completed two full years of operation without a disabling injury. The occasion was celebrated on June 7 by four hundred persons representing employees and their families. They gathered at the plant to hear Howard A. Cowden, president of the company, deliver the congratulatory address.

Olin Hughes, safety engineer of MFA Mutual Insurance Co., Columbia, Mo., presented commemorative safety plaques; one as a permanent trophy and the other a revolving one for winning the annual safety contest in the industrial division. Individual safety awards were made by Walter R. Horn, FCC general manager.

OUTPUT

Continued from page 2

2,000 tons, as compared to March, 1960.

Ammonium nitrate, ammonium sulphate, nitrogen solutions and sulfuric acid all saw reductions in output in April this year. Total production of ammonium nitrate in April, 1960, was 239,166 tons. The same month last year saw an output of 243,708 tons.

Ammonium sulfate dropped to 68,683 tons in April, 1960, from 97,201 tons the same month of 1959. Stocks at producing plants, however, were considerably lower this April, the respective figures being 134,577 tons against 173,757 tons in March.

Nitrogen solutions were also on the short side in April, 1960. Total production amounted to 104,960 tons this April as compared to 109,235 tons in the same month of 1959. This was partially compensated for with a much lower stockpile at manufacturing plants. In April this year, the stocks on hand amounted to 40,717 tons as compared to 73,109 tons in March.

Gross total output of sulfuric acid for April, 1960, was less than that of the same month of 1959, the report says. Respective figures for that month of 1960 and 1959 were 1,536,967 tons and 1,595,879. The report did not indicate how much sulfuric acid was in stock at producing plants.

Buffalo Superintendent

NEW YORK—J. J. Repko has been named production superintendent for fertilizers and chemicals at the Buffalo, N.Y., plant of the American Agricultural Chemical Co., announced R. M. Richey, general superintendent.

Mr. Repko was formerly assistant superintendent at Buffalo.

PHOSPHATE

Continued from page 2

phate saw an increase, rising to a production total of 762,443 tons as compared to 706,377 tons during the same period the previous season. This was an increase of 8%. Shipments were also on the increase, although on a smaller scale. They were 758,484 tons in the 1960 season and 751,407 tons in the previous July-April period.

Both production and shipments of other phosphatic fertilizers were considerably on the increase during the late season, according to the report. Production in the latest period was 297,952 tons as compared to an output the previous season of 250,856 tons, an increase of 19%.

Shipments of other phosphatic fertilizers increased almost as much. In this category, the figures were 286,214 tons in the latest season, and only 245,032 tons in the same period of last year. This was an increase of 17%.

Production in April of this year was down from the figures of both the previous month and the previous year. Output in April, 1960, was 242,901 tons, but had been 257,522 tons the same month a year before. March output was 252,501 tons.

Normal and enriched production suffered the greatest setback, with production in April, 1960, being 128,231 tons whereas the 1959 output for the same month was 156,705 tons. Production for March came to 133,354 tons.

The Department of Commerce has also just released figures on superphosphate and other phosphatic fertilizers for the entire year of 1959. Total production, it says, totaled 2,609,592 tons, a considerable increase over the 2,380 863 tons produced in 1958. Shipments, likewise, were up in 1959, the respective figures being 1 885,001 tons and 1,768,328 tons.

Details of the 1959 production, shipments, consumption and stocks for 1959 are given in the table on page 2.

KHAPRA

Continued from page 2

Lakes area officials of the U.S. and Canada are cooperating closely because the problem is common to both countries.

Unless infestations of the beetle in ships and on cargo can be detected and destroyed, the insects can become established in granaries, warehouses and conveyances used in interstate commerce.

ARS officials are bringing the increasing number of interceptions to the attention of agriculture officials of countries from which beetle-infested ships and cargoes have come, urging that precautionary measures be taken with shipments destined to the U.S. to eliminate the pests at point of origin. Because of the beetle's habits, inspectors must search many types of general cargo as well as ships' food stores, quarters and cargo holds.

Preventive measures taken in exporting countries to assure insect-free shipments would prevent the expense and delay involved in fumigating infested ships and cargoes arriving in this country, said USDA. Fumigation may require immobilizing a ship and sealing it up tightly to kill the beetles. Cost of fumigation, which can run into thousands of dollars, must be borne by ship owners.

Native of India

The pest, a native of India, Ceylon and Malaya—where it is considered the most serious of all storage pests—is now found in several European, African and other Asiatic countries.

The beetle feeds on a wide variety of grains, on dried food products, and on hides, glue and other animal products as well. The insects and their larvae have been found in cardboard cartons, under labels on canned foods, on automobiles, steel wire, bags and wrappings of various kinds of general cargo, and in crevices and cracks in store rooms and holds of ships. Beetle larvae can exist for long periods of time without food.

NAMED DIRECTOR

WILMINGTON, DEL.—Atlas Powder Co. has announced the election of Thornton F. Bradshaw, Haverford, Pa., to its board of directors. Mr. Bradshaw is a vice president and member of the board of directors of The Atlantic Refining Company.

last year over 125 firms received greater merchandising impact from their multiwalls thru UNION-CAMP'S

BAG DESIGN

another FREE service of the ★ Star Packaging Efficiency Plan!

Over 125 multiwall users last year cashed in on the bag design feature of the 5-Star Packaging Efficiency Plan. In some cases UNION-CAMP artists came up with striking new bag designs which contributed to increased sales. In others they created a family of high-recognition designs for a complete product line. In still others they developed simplified, faster-reading identification prints —resulting in thousands of dollars worth of savings.

Through the 5-Star Plan, UNION-CAMP artists and designers may help you achieve greater merchandising impact from your multiwalls. Their services are free.

Besides bag design this comprehensive packaging service offers you major money-saving improvements in bag construction, specifications control, packaging machinery and materials handling.

See your local UNION-CAMP man for details.

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MULTIWALL BAGS
Union Bag-Camp Paper Corporation · 233 Broadway N.Y. 7, N.Y.

★ BAG DESIGN · BAG CONSTRUCTION · SPECIFICATIONS CONTROL · PACKAGING MACHINERY · PLANT SURVEY

Collier Announces Arrangement to Produce New Highly-Concentrated Phosphoric Acid

LOS ANGELES—Collier Carbon & Chemical Corp. announced on July 1 that it had entered into a phosphoric acid manufacturing arrangement with The Bunker Hill Co. Under a secrecy agreement, Bunker Hill will manufacture exclusively for Collier, a highly-concentrated green acid having unique characteristics. A new process and plant design developed by Collier will be used in the operation at Bunker Hill's recently-completed phosphoric acid plant in Kellogg, Idaho.

According to Homer Reed, vice president in charge of research and development for Collier, the properties of the new product, to be named "ALP" (anhydrous liquid phosphate), will enable it to find wide application in the manufacture of high analysis fertilizers.

Initial production of ALP, scheduled for early 1961, will be used by Collier in the manufacture of its liquid fertilizer 8-24-0 and new higher analysis liquid and solid phosphates.

"The new process assures Collier of a strong position in phosphates," Mr. Reed said. The firm is a pioneer in the production and distribution of neutral liquid mixes and aqua ammonia, markets its agricultural chemical fertilizer under the Brea tradename in Western U.S., Hawaii and Mexico.

NEW PLANT

GREELEY, COLO. — The Niagara Chemical Division of Food Machinery & Chemical Corp. has started operation of a new plant in Greeley, Colo., for production of pesticides.

Chase Names Engineer

NEW YORK—Richard J. Price has been appointed chief industrial engineer of the Chase Bag Co.

In his new post, Mr. Price will direct the company's industrial engineering department, now headquartered at St. Louis, Mo.

He was previously associated with Continental Can Co. in various industrial engineering capacities, and is a graduate of Ohio State University.

Group Visits Plant

LIMA, OHIO — High spot of the first day of the annual 3-day conference of the American Grassland Council, June 14-16, at Ohio State University, was a bus tour to the plant of the Sohio Chemical Co. at Lima. This national conference, under the joint sponsorship of the American Society of Agricultural Engineering, drew a large audience to Columbus.

Plans Announced For New Alabama Fertilizer Plant

CULLMAN, ALA. — The Cotton Producers Assn. has announced plans for the construction of a new granular fertilizer plant.

Ground breaking on the new plant, which is to be located about 12 miles south of here, was scheduled to begin on July 1, with completion set for Dec. 1.

The building will be of mill type construction, the association says.

Plans Made for Stable Pyrethrum Development

NEW YORK — Long-range activities towards production of pyrethrum for the American insecticide market were described in conferences with American pyrethrum refiners during a recent visit to the U.S. by the principal spokesman for this industry.

D. H. Pell-Smith, chairman of the Pyrethrum Board of Kenya, and an agricultural producer for 40 years, devoted the month of May to conferences in this country and in Europe. Mr. Pell-Smith was one of the pioneers in developing the cultivation of pyrethrum on the high plateau of Kenya.

The Kenya Board is a semi-official agency that licenses production of the flower, conducts research for improvement of quality, operates preliminary extraction facilities and exports crude extract for the account of the growers.

American pyrethrum refiners have contributed to technical developments of pyrethrum and methods of application.

Mr. Pell-Smith, in discussing the possible effect of political changes in Africa — including independence of the Congo and Tanganyika, and anticipated independence for Kenya— would have on American supplies of pyrethrum, said that the pyrethrum industry will continue to meet its world commitments regardless of political developments in Kenya. "There are ample evidences that our feelings are shared by those abroad who study African movements closely for business reasons," he said.

"An independent Kenya, run by a native government, as their leaders know, would do everything possible to foster agriculture of all types, as this is the mainstay of the modern Kenya economy. It is noteworthy that in recent weeks a banking group in the British Commonwealth has made to the Pyrethrum Board a long-term loan of $1 million to finance construction of additional crude extraction facilities."

New Chicago Manager

CLIFTON, N.J.—The appointment of C. A. Cremens as Chicago district manager, effective Jan. 1, 1960, has been announced here by Richardson Scale Co.

Prior to this appointment, Mr. Cremens was a sales engineer with headquarters in Chicago. He has been with the firm for 14 years.

C. A. Cremens

NEW SPRAY FIRM

GREENVILLE, S. C. — General Spray Service, a new enterprise for this area, has begun operations at 805-A W. Parker Road. The new firm, headed by James F. and Jody Amspacher, brothers, specializes in a mechanized method of spraying gardens, lawns and shrubbery.

PANEL

Continued from page 5

156.25 tons, and for a 1 lb. overweight 625 tons.

The speaker urged his listeners to realize that some variations may exist in incoming raw materials. He reported that although differences may be slight, they still may be enough to change a manufacturer's formulation. Of ten cars of muriate of potash, he said, analysis ranged from a high of 61.80% down to 60.40%; in the same number of cars of superphosphate, A.P.A. analysis ranged from a high of 48.02% down to 44.82%. In the same group of cars, moisture ranged from a high of 6.76% down to 3.60%.

California Ag School To Move from UCLA

LOS ANGELES — The regents of the University of California have authorized establishment of a college of agriculture on the Riverside campus to meet the continuing needs of agriculture in the southern part of the state.

At the same time, the regents terminated the college of agriculture on the Los Angeles campus. The college will be gradually "phased out" during the next few years and transferred to other campuses as facilities become available—most of its activities probably going to Riverside.

The action was taken by the regents following 18 months of study by various administrative and regents committees.

Clark Kerr, president, said that Daniel G. Aldrich, dean of agriculture, had consulted not only academic groups, but also representatives of California agriculture about the changes.

The university's statewide division of agricultural sciences also maintains colleges of agriculture on the Berkeley and Davis campuses.

Two New Departments By Olin Mathieson

NEW YORK—Formation of two new departments for process development in the chemicals division of Olin Mathieson Chemical Corp. has been announced by Edward Block, senior vice president and general manager of the division.

M. C. Metziger has been named director of the new development department for Blockson Chemicals, Joliet. He was director of research and development for Blockson Chemicals. C. S. King, who was associate director for inorganic research, has been appointed associate director of this department.

B. H. Nicolaisen has been named director of the new development department, industrial chemicals, at Niagara Falls, N.Y. He was assistant manager of research and development, industrial chemicals. Dr. W. C. Gardiner, formerly manager of research engineering, has been named manager, electrochemicals section, development department, industrial chemicals.

C. E. Rowe continues as director of development, organic chemicals, Brandenburg, Ky.

Mr. Block said these development departments will be responsible for pilot plant operations for new products and processes, improvement of present processes, related laboratory research, and certain special research.

NAMED SECRETARY

DENVER — The appointment of Robert L. Wier, Denver newspaperman, as executive secretary of the Colorado Grain, Milling & Feed Dealers Assn. was announced by James Rawson of Burlington, Colo., association president.

DuPont Realigns Research Division

WILMINGTON, DEL. — Realignment of the research division of the industrial and biochemicals department to put greater emphasis on long-range research was announced June 20 by the Du Pont Company.

This type of work has been consolidated in two pioneering research units, while research more closely connected with present products will be concentrated in other units, according to Dr. Max T. Goebel, director of the division.

As at present, the division will pursue broad lines of research in the fields of industrial chemicals and biochemicals. Dr. Marcus A. Naylor, an assistant director of the division, will continue to head all industrial chemicals research, and Delbert Van Fletcher, assistant director, will continue to direct work on biochemicals.

Pioneering research on industrial chemicals will be directed by Dr. Ralph K. Iler and key posts in the unit will be held by Dr. Warren K. Lowen and Dr. Charles J. Mighton as section managers. Research more closely related to the established industrial chemicals will be headed at the experimental station by Dr. Ivan M. Robinson, and at the Belle, W. Va., laboratory by Elbridge R. Graef, director, with Dr. Robert J. Kallal as section manager at Belle.

Pioneering research in the field of biochemicals will be under the direction of Dr. Thomas R. Wood, who will also continue as manager of the Stine Laboratory — already engaged primarily in long-range work. Key men in this realignment will be Dr. Walter A. Gregory, senior research scientist, and Dr. Edward C. Hermann and Dr. Hans R. Rosenberg as section managers. Research on process development and agricultural chemicals, more closely related to the department's present biochemicals products, will be headed by Dr. Roger E. Drexel as manager. Key posts in this unit will be held by Dr. Rayner S. Johnson, Dr. Richard J. Gobeil, and Dr. Glen D. Barbaras as section managers.

WEED CONTROL BULLETIN

MORGANTOWN, W. VA.—"Weed Control—1960 Suggestions," a publication which lists general suggestions for the proper use of herbicides, safety precautions, optimum time and concentration of applications, persistence and residual effects and general observations, has been announced by the West Virginia University Agricultural Experiment Station. Collins Veatch, experiment station agronomist, was the general supervisor of the publication.

Croplife®
A BUSINESS PAPER FOR THE FARM CHEMICAL INDUSTRY

Changeover from Art to Science . . .

Chemical Controls in Fertilizer Plants No Longer a Luxury . . . Losses Outweigh Cost Of Modern Equipment to Reduce Shrinkages

CHEMICAL CONTROL of every step in the fertilizer production process has become an important factor in maintaining quality and avoiding the pitfalls of overformulation or underweight bags. The panel discussing chemical controls at the recent convention of the National Plant Food Institute brought out some helpful ideas on how to keep everything under control.

The methods used in sampling fertilizers; the analytical procedures in determining the percentages of N, P_2O_5, and K_2O, and the sources of loss of product in the plant were all discussed. So were methods which might well be employed to stop shrinkage of materials through steam, gases, dust, spillage and overweight fillings.

Dr. Vincent Sauchelli, chemical technologist for the NPFI, as moderator of the panel, pointed out that lack of adequate controls is costing the fertilizer industry an estimated $6 to $8 million each year, and that the losses in some individual plants are surprisingly high.

Most of the suggested ways to stop such losses are attainable through an upgrading of equipment . . . completely accurate scales; keeping conveyor belts and other material handling devices as sift-free as possible; efficient dryers and coolers, and dust collectors to avoid significant loss.

Mechanical losses are usually easier to detect and to halt than are the less obvious and more costly ones having to do with overformulation. It is in this area that the chemical laboratory swings into action. Its job is a tough one. It concerns itself with bulky, fairly crude materials prepared in large volume. These materials, as every manufacturer knows, vary in particle size, density, shape and composition. Thus, it is not easy to draw a representative sample of such materials from a pile made up of many tons of numerous batches, each varying in a number of ways one from the other.

In former days, the task was not as complicated because of the nature of earlier fertilizer products of lower analysis. But present-day technology has created new problems because modern high analysis fertilizers contain a much higher concentration of plant food. Many of these materials are hygroscopic and absorb moisture quickly from the air. Processing has become complex and requires the careful measurements and controls characteristic of modern chemical engineering. Trouble comes when too many variations occur in the composition of the materials, in the calculations of the formulas, in the various measuring devices, and in the operating personnel.

The control laboratory of the plant becomes an increasingly important entity under modern production conditions. It is called upon to chart the course to reduce costs and to avoid the penalties of state inspection; it must keep formulations within strict bounds and prevent other inefficiencies that lead to higher manufacturing costs; and it must insure the company against putting on the market products below the guaranteed analysis.

In commenting on this, Dr. Sauchelli observed that the control laboratory "is and should be one of the strongest aids to management, linking research, production and sales and insuring good will among customers. And yet, in many organizations in our industry having a chemical laboratory, this important section is not rightly appreciated by top management.

"Why? Who knows? Perhaps it is the shortsightedness of top administrators, or the failure of the chemist-in-charge to publicize his worth or demonstrate his value to the operating and sales personnel. The time is not far off, however, when the force of events will necessitate a well-equipped chemical control unit in each fertilizer company capable of inspiring respect and confidence, within and without the company. The control chemist will then come into his own, will be given full opportunity to show his value and be properly rewarded, financially and otherwise, as will be his due."

The need for some means of checking and controlling "everything" having to do with production is a big order, but apparently a necessary one. Other panelists appearing at the NPFI conference enlarged upon their moderator's comments. Dr. Stacy Randle, president of the Association of American Fertilizer Control Officials, said that continual study needs to be made on the variables in raw materials, errors in weighing and mixing and other complexities involved in manufacturing. He reiterated that the industry can save itself thousands of dollars each year in closer attention to chemical controls.

Albert Spillman, Fertilizer Manufacturing Cooperative, Baltimore, took a practical view of the entire problem, stating that fertilizer production people must realize that manufacturing these complex plant food products has now passed from being an "art," to an exact science and must therefore be regarded as such. He reiterated some of the thoughts expressed by fellow-panelists, that high-analysis goods are too valuable to be wasted through either carelessness or inadequate equipment in the plant.

Testing of incoming raw materials is also an important procedure, since variations in these can alter formulations to either wasteful overages or costly and embarrassing under-analysis products.

It all boils down to need for broader and more accurate controls within the plant. An increasing number of firms are investing in chemical control facilities and it is likely that they will pay off in a number of ways.

The matter was pretty well summarized by one panel member who remarked: "A company's most precious asset is its reputation and ability to distribute quality products. When a company fails to use sound sampling and laboratory techniques, reputations are at stake."

It might be added that since a company's reputation does ride on the quality of its branded products, a means to be SURE of its guaranteed analysis is of extreme importance.


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EXECUTIVE AND EDITORIAL OFFICES — 2501 Wayzata Blvd., Minneapolis, Minn. Tel. Franklin 4-5200. Bell System Teletype Service at Minneapolis (MP 179), Kansas City (KC 295), Chicago (CG 340), New York (NY 1-2452), Washington, D.C. (WA 82).

Published by
THE MILLER PUBLISHING CO.
2501 Wayzata Blvd., Minneapolis, Minn.
(Address Mail to P. O. Box 67, Minneapolis 40, Minn.)

Associated Publications—The Northwestern Miller, Farm Store Merchandising, Feedstuffs, Feedlot, Professional Nursing Home

INDUSTRY MEETINGS

July 5-7—Agricultural Aircraft Assn., Inc., 11th annual convention, Hotel El Dorado, Sacramento, Cal.

July 13-15—Eleventh annual Fertilizer Conference of the Pacific Northwest, Hotel Utah, Salt Lake City. B. R. Bertramson, State College of Washington, Pullman, Wash., chairman.

July 27-29—Great Plains Agricultural Council, 1960 meeting, Laramie, Wyo.

July 27-30—Southwest Fertilizer Conference and Grade Hearing, Galvez Hotel, Galveston, Texas.

July 28-29—Annual tour of fertilizer and lime industries sponsored by extension service and experiment station at Auburn University, Auburn, Ala. Tour begins 10 a.m. July 28 at Brewton, Ala.

Aug. 2-3—Annual summer meeting, Ohio Pesticide Institute, Ohio Agricultural Experiment Station, Wooster.

Aug. 7-11—Rocky Mountain Conference of Entomologists, Cameron Pass, Gould, Colorado.

Aug. 10—Northeast Fertilizer Industry Safety Training School, New York.

Aug. 16-17 — Midwest Fertilizer Industry Safety Training School, Chicago.

Aug. 25-27—Southeast Fertilizer Industry Safety Training School, Wilmington, N.C.

Sept. 12-14—Eighth annual meeting and conference, Canadian Agricultural Chemicals Assn., Britannia Hotel, Lake of Bays, Muskoka, Ont., Can.

Sept. 24-26 — Western Agricultural Chemicals Assn. 31st annual meeting, Palm Springs Riviera Hotel, Palm Springs, Cal.

Sept. 29-30 — Northeast Fertilizer Conference, Hotel Hershey, Hershey, Pa.

Oct. 5-6—Southeast Fertilizer Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

Oct. 17-21—National Safety Congress, 48th annual meeting. Fertilizer Section meets at Morrison Hotel, Chicago.

Nov. 3-4—Pacific Northwest Plant Food Assn. 1960 annual convention, Boise, Idaho.

Nov. 13-15—California Fertilizer Assn., 37th annual meeting, del Coronado Hotel, Coronado, Cal.

INDEX OF ADVERTISERS

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New Calspray Facility Nears Completion

RICHMOND, CAL. — California Spray-Chemical Corp., manufacturer of insecticides and fertilizers, is nearing completion of its new Yuba City office and warehouse. This facility is located near the intersection of Garden Highway and Lincoln Road.

The new building will house, in addition to office and warehouse facilities, an aqua converter for converting anhydrous ammonia to aqua ammonia, a mix plant, producing various formulations of liquid fertilizers, and tank storage facilities for ammonium nitrate and calcium ammonium nitrate solutions. Contractor for the project is C. A. Otto of Marysville and the approximate total cost for the project is $120,000.

IMC Workers Choose Union in NLRB Election

NIAGARA FALLS, N.Y.—The 81 production and maintenance workers at the International Minerals & Chemical Corp. voted to remain with the Oil, Chemical and Atomic Workers International Union, AFL-CIO.

The United Mine Workers Union had sought to regain the bargaining rights it had lost 18 years ago.

The vote in the NLRB election was 42-38 in favor of the OCAW, with one vote void.

An election held previously failed to decide the issue when two persons voted for no union, 40 went for OCAW and 39 voted for UMW. The NLRB then scheduled a second election.

The UMW, then a part of CIO District 50, represented the International Minerals & Chemical workers until the UMW separated from the CIO in 1942. An NLRB election at that time was won by the OCAW, which has held bargaining rights ever since.

Classified Ads

Classified advertisements accepted until Tuesday each week for the issue of the following Monday.

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All Want Ads cash with order.

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FOR SALE—SIX USED CLEAN 10x30 ALL welded tanks with ⅜" walls, 17,000 gal., $700. Can deliver. Napoleon Alfalfa Mills, Inc., Napoleon, Ohio; Phone 21921.

FOR SALE—BEMIS 3 BUCKET ELECTRO-mechanical open mouth bagger, series No. 6107, contact parts stainless steel, very accurate. Available July 1, $500. C. Roy Curtis & Son, Inc., Marion, N. Y.

For Results . . .
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Elected Vice President

NEW YORK—Election of Dr. Guy T. McBride, Jr., as vice president of Texas Gulf Sulphur Co. has been announced by Claude O. Stephens, president. After having acted as a chemical engineering consultant to the company for several years, Dr. McBride joined Texas Gulf on June 1, 1958, and a year later was named manager of the research department. He was formerly associate professor of chemical engineering and dean of students at the Rice Institute, Houston.

Serving customers who buy NH_3 and Nitrogen Solutions . . .

All in a Day's work for George

George Day, that is. George is the man customers have come to depend upon for these reasons: (1) George is from Standard Oil, a supplier with 70 years' experience making products that meet specifications and delivering these products to customers *on time*. (2) The Standard Oil Anhydrous Ammonia and Nitrogen Solutions which George sells are produced in one of the industry's most modern plants located in one of the best railway and highway shipping centers in the U.S. (3) One of the Midwest's largest quality control laboratories insures the high quality and "on spec." character of these products.

Customers also know George can be depended upon to look after their needs. Twenty-three years' experience serving customers for Standard Oil has taught him how to give these customers the kind of service that means profits *for them*.

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You expect more from **STANDARD** *and you get it!*